the UNESCO Courier

PEOPLE AND PLACES
Potosi's silver tears

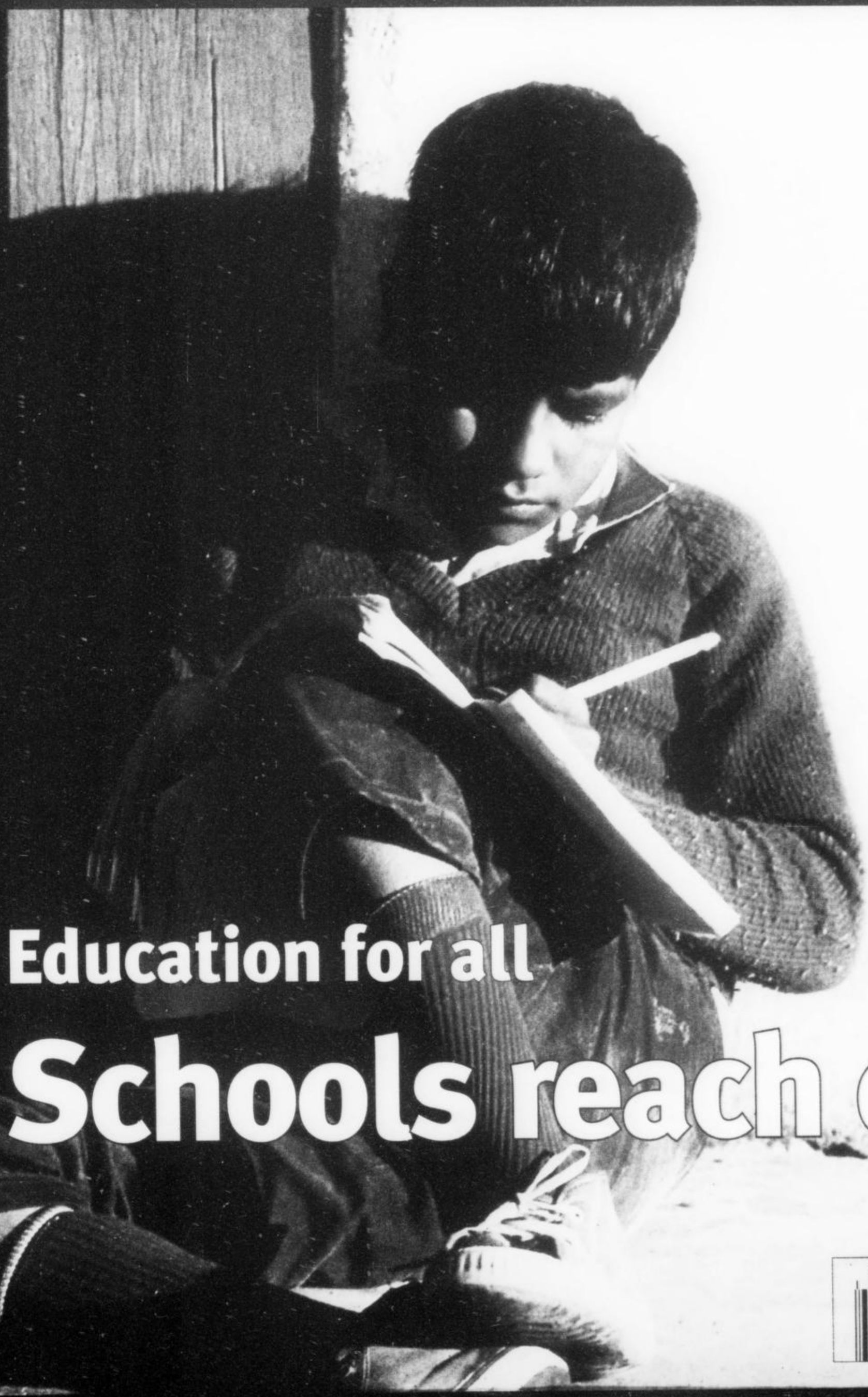
PLANET
Energy's wind of change

SIGNS OF THE TIMES
Computers rebuild the past

INTERVIEW
John Abbott, South Africa's city stitcher

UNESCO the Courier

March 2000



Education for all

Schools reach out

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Focus

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Education for all

Schools reach out

On the eve of an international conference which is being held to take stock of action to promote education for all during the last decade, this Focus section showcases projects that reach the excluded through grassroots involvement. But if education is to become a right and a source of enrichment for everyone, many other innovative approaches and bold commitments will be required.

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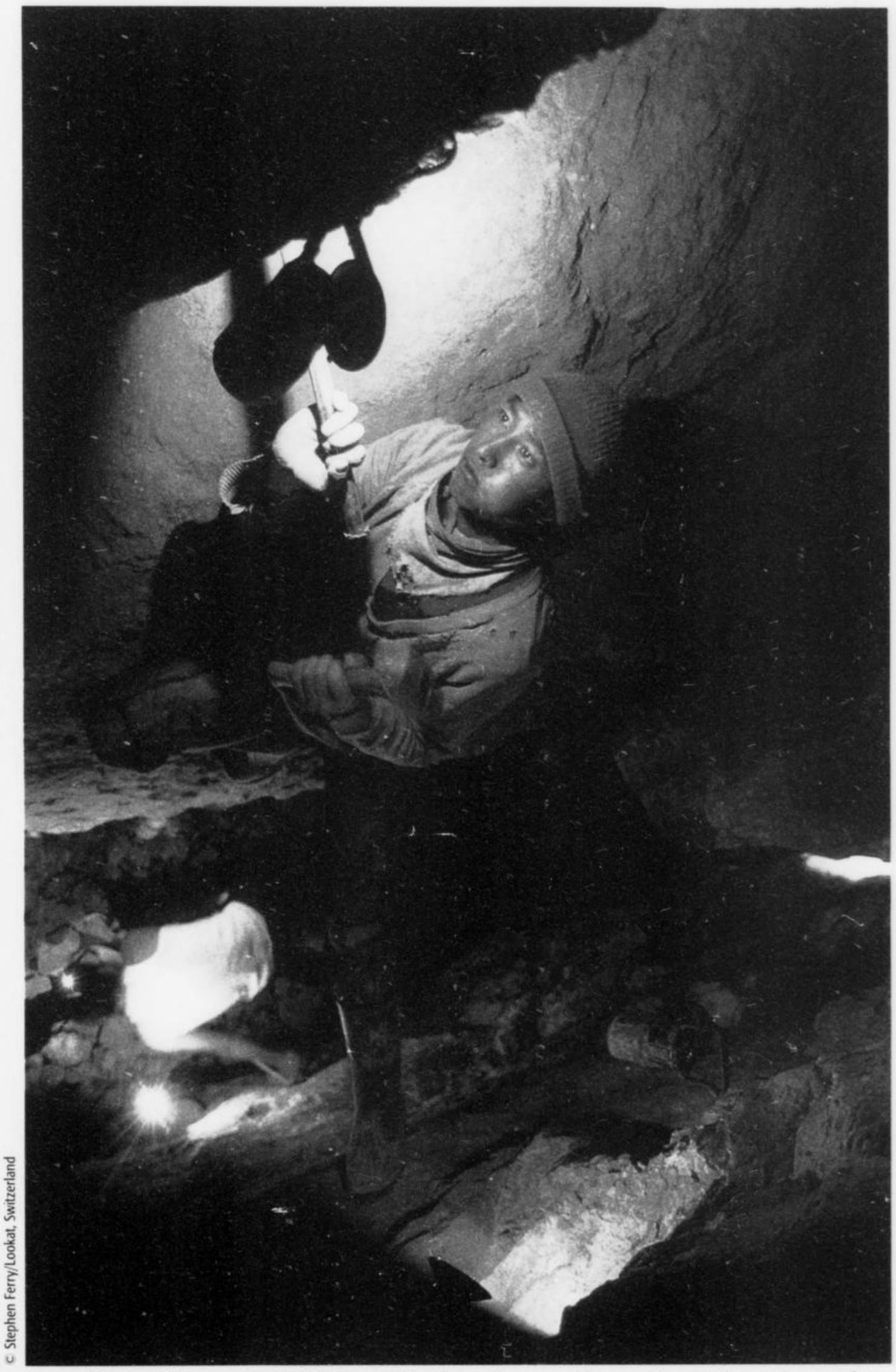
POTOSI'S SILVER TEARS

Photos by Stephen Ferry; Text by Amalia Barron

The city that once made Europe rich is dying. The impoverished miners who live there are struggling to survive amid the ruins of its bygone splendour



© Stephen Ferry/Lookat, Switzerland

Deep within Potosi's Cerro Rico ("Rich Mountain"), silver miners sometimes work more than 10 hours a day. They chew coca leaves to help to alleviate the harsh conditions.

"It's so poor, it makes you want to weep," says Bolivian historian Valentin Abecia. He's not exaggerating. A visit to Potosi, which helped to maintain the splendour of Europe from the 16th to the 18th centuries, is today a spine-chilling experience.

Around two billion ounces of silver were extracted from the city's Cerro Rico (Rich Mountain) during the Spanish colonial era. Cerro Rico silver paved Potosi's streets, fuelled the European Renaissance and helped fund the "Invincible Armada", the Spanish fleet that sailed against Elizabethan England in 1588.

But today Potosi is dying. "When a mine closes, all that's left is a ghost town," says the city's mayor, René Joaquino. Something of Potosi ebbs away whenever a seam of metal is exhausted or world mineral prices drop. Most of the mines closed down after a crisis in 1985 and many people left for good. Two years later, when the Bolivian government introduced new incentives to mining, unemployed miners began to trickle back and set up 50 co-operatives.

Streets paved with silver

Most of the city's population of around 120,000 are Quechua Indians, who live by scratching at what is left in the old mines. They have no access to modern technology and no social security protection. There is practically no middle class in Potosi. "I don't know any rich people who live in this city," says Abecia. "Some have made money here but then they left to live elsewhere. The old houses are falling into ruins, and their furniture and fittings have been removed. The few things that have been preserved are in the Casa de la Moneda (the Royal Mint)." Abecia is the curator of the museum funded by Bolivia's Central Bank which is housed in this historic building.

In 1572, in colonial times, Spanish Viceroy Francisco de Toledo created a system of forced labour called "la mita". Every seven years, for a period of four months, all males ▶

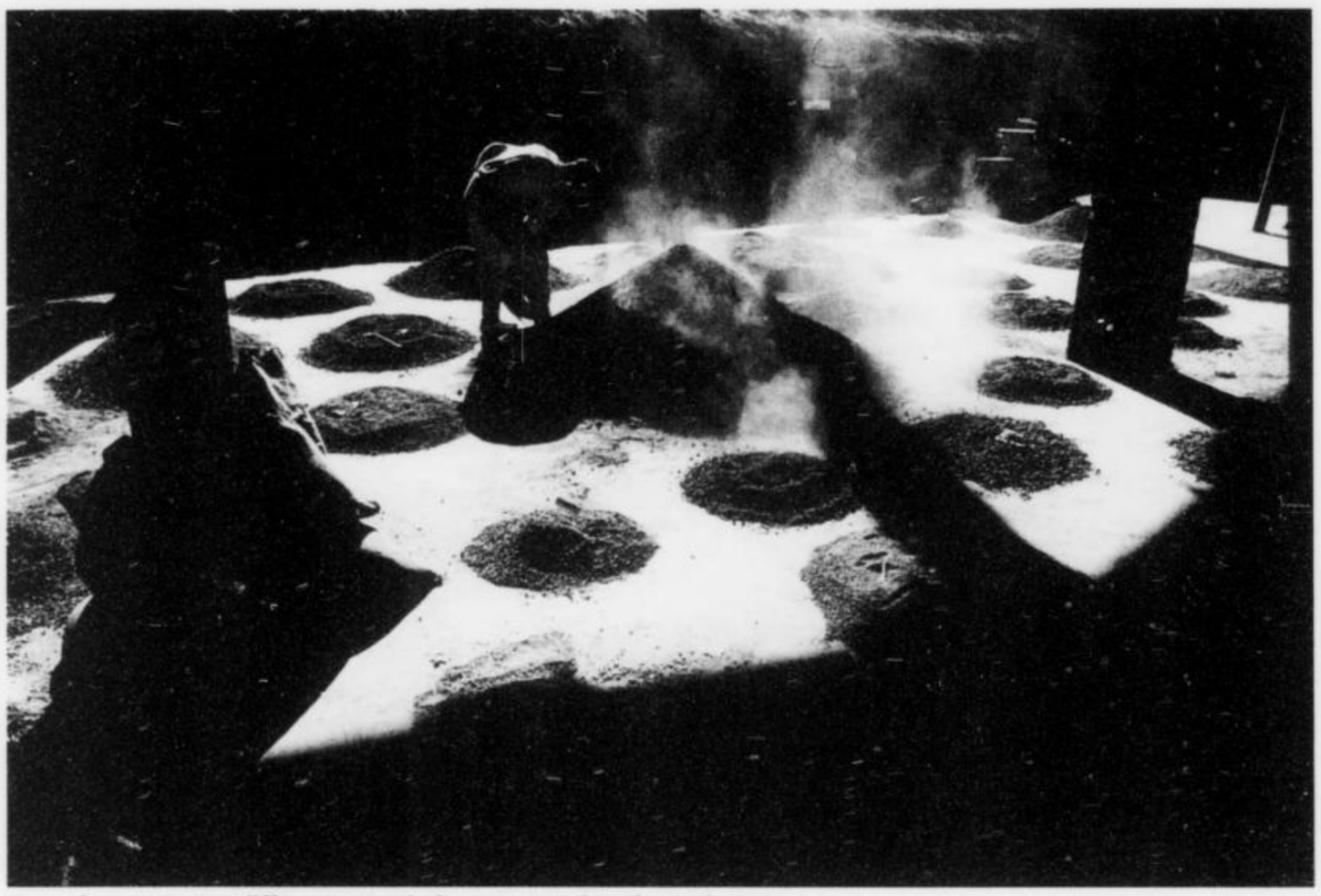
Stephen Ferry is an American photographer.
Amalia Barron is a journalist based in La Paz, Bolivia.

between 18 and 50 were ordered to work in the mines. They were paid a pittance and rarely saw the light of day. Eighty per cent of the male population of the 16 provinces of the viceroyalty of Peru died in these conditions. "Every peso coin minted in Potosi has cost the life of 10 Indians who have died in the depths of the mines," wrote Fray Antonio de la Calancha in 1638.

Mining methods have changed little over the years. The miners still toil from dawn till dusk. Generators pump air into the tunnels so they can breathe. Children still wriggle into tiny places where adults cannot go. Working sometimes for 10 hours or more a day in extreme temperatures, the miners keep going by chewing coca leaves. Two-thirds of the population have respiratory ailments.

"Barely 20 per cent of the mine-workers are actually members of the co-operatives," says Joaquino. "The other 80 per cent are casual labourers who earn next to nothing. They are peasant migrants from the north, the poorest part of the department of which Potosi is the capital."

The historic centre of Potosi, where the Spanish settlers once lived, is today home to a small middle class. It is ringed by a poverty belt inhabited by miners who work in the co-operatives. Both these areas are surrounded by a wider poverty belt filled with those who have fled the hunger of the countryside to hire themselves out as unskilled labourers in the mines.



A worker sorts out different metals from ores taken from the mine.

Peasant women from the north come to the city to beg. They sleep on the ground in the markets, numb with cold, cradling in their arms the babies they have brought with them. Bernardina Soles has had 10 children. Five of them have died—a grim reminder of an infant mortality rate of 135 per 1,000. Her dream is to take some of her children away from her home village, where they could only have two years of primary schooling. The illiteracy rate in the department of Potosi is 30.8 per cent.

Lost splendour

"Potosi society is rotten with ostentation and extravagance," says Uruguayan writer Eduardo Galeano, "but the memory of its past splendours still lingers and it still has the ruins of its churches and palaces." UNESCO is backing restoration projects for about 2,000 colonial buildings and is monitoring the conservation of the Cerro Rico, where the mining installations dating from colonial times are historic monuments. They include tunnels, equipment, mills, furnaces and a network of 22 artificial pools built by Viceroy Toledo to help power the equipment.

"I remember that when I was a boy the Cerro was a perfect cone, a beautiful red mountain just south of the city," says Abecia. "But over the past 50 years, it has aged, been hacked about and fallen apart. The co-operatives have extracted so much rock from it that it doesn't look the same any more." UNESCO's main goal is to convince the Bolivian authorities to take steps to preserve as World Heritage a site which Spanish chroniclers regarded as a "perfect and enduring wonder of the world". ■

POVERTY ON A SILVER THRONE

Mining has always been Potosi's lifeblood. Modern prospecting technology has discovered that the mountain still contains at least as much silver as the Spaniards extracted from it. The Bolivian government has invited foreign firms to bid for the contract to mine it.

In recent months, argument has focused on what form the new mining operations should take. Should the top of the mountain be cut off–this would be the cheapest method but it would disfigure the mountain–or should a horizontal tunnel be bored through to the heart of the ore-bearing rocks?

Geologist Jaime Villalobos, a former Bolivian minister of mines, says "most of the ore is concentrated inside the peak. El Cerro's rock has lots of mineral seams of different sizes suitable for modern methods of extraction. It's economically feasible to remove all the rock, crush it and process it. The cheapest way to extract it would be the open-cast method."

This means cutting into the top of a mountain that is a national emblem. The people of Potosi are against that: 97 per cent of them said in a poll they would rather starve than see the silhouette of El Cerro disappear and, with it, the World Heritage title.

They would prefer to see a horizontal shaft bored, as UNESCO has advised. However, this option is more expensive. It means digging the shaft and extracting the ore while preserving the shape of the mountain. When he was minister, Villalobos says his investigations showed the Cerro contained "more than half a million tons of silver-bearing ore. But that doesn't mean it's economically feasible to extract because a lot of it is low-grade ore." The company that wins the contract to mine the mountain will have to study this.

People in Potosi show discontent when they talk about mining. Villalobos understands. Mining, he says, "whether in colonial times, or whether by the private sector or by the state-owned Bolivian Mining Corporation, has taken non-renewable resources from the area and left behind only contamination and poverty. This project should have a built-in guarantee to create wealth for Potosi," he says. ■

Bolivia

Area: 1,098,581 sq km
Population: 7,773,000
Capital: Sucre (official) and La Paz (seat of the government)
GDP per capita: $1,003

Source: Anuario Iberoamericano 1999, Agencia Efe

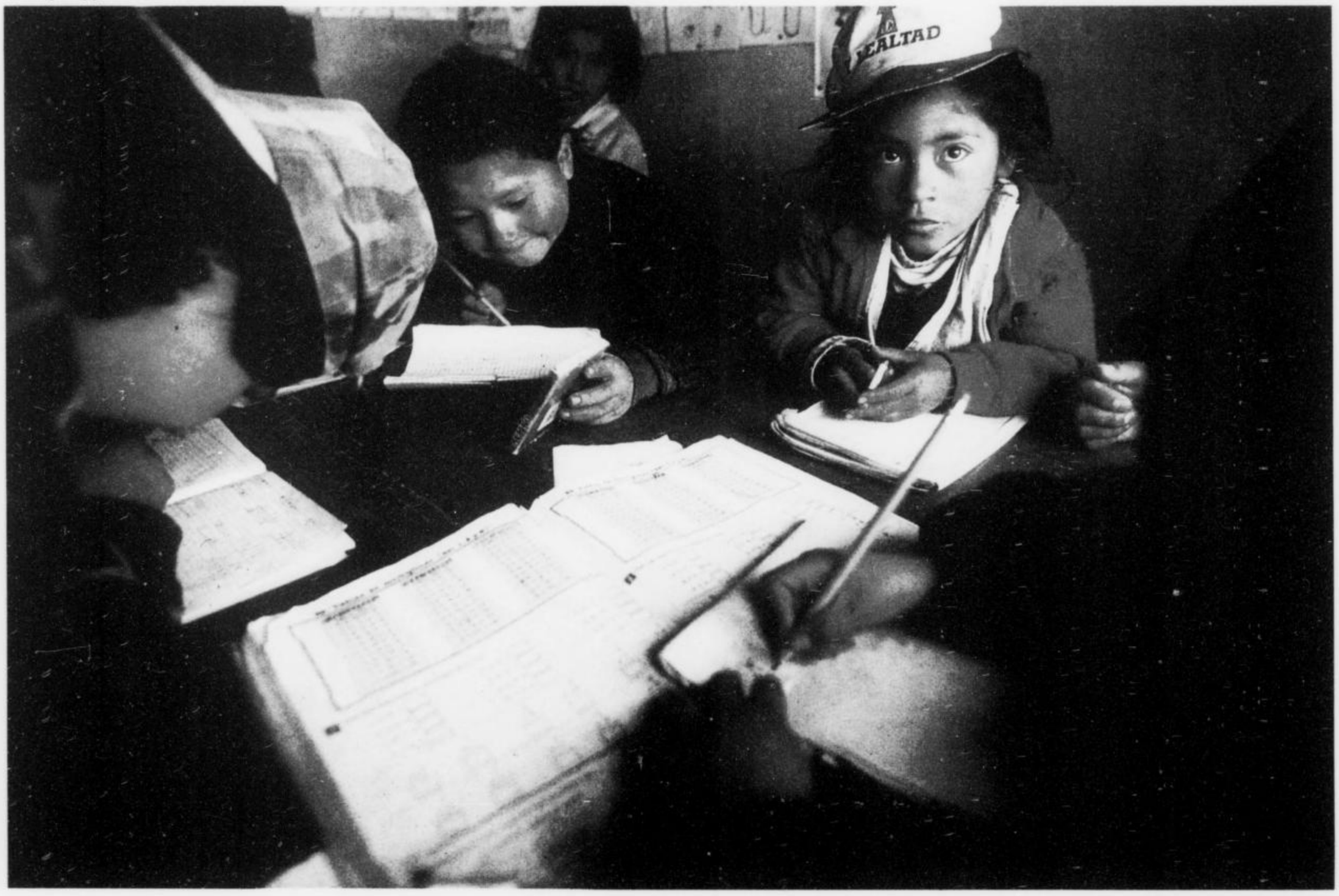
Miners manhandle a wagonload of ore from the mouth of the mine to the crushing machine.

A "palliri", a miner's widow, searches the surface of the mountain near the San German mine shaft for stones containing silver, tin or zinc.

© Stephen Ferry/Lookat, Switzerland

A family of miners in their one-room home in Potosi's Calvario neighbourhood.

Children of "palliris" (miners' widows) at school. As well as doing schoolwork, the children shoulder many responsibilities at home. Sometimes they work to help support their families.



The miners' carnival is a time of religious fervour and heavy drinking.

A Quechua indian family on the Cerro Rico mountain peak. During colonial times the Quechua and Aymara inhabitants of the viceroyalty of Peru's 16 provinces were a reservoir of forced labour for the Potosi mines.

© Stephen Ferry/Lookat, Switzerland

A miner doffs his hat to salute the passing of St Bartholomew during a pilgrimage near Potosi. The miners honour their favourite saints over several days of Christian and pagan celebrations.

A drunk miner chews coca leaves during a festival in honour of Tio, the devil of the mines. The miners sacrifice a llama to Tio three times a year in the hope that he will spare their lives.

© Stephen Ferry/Lookat, Switzerland

ENERGY'S WIND OF CHANGE

Birger T. Madsen

Wind energy is rapidly developing as an environmentally sound and cost-effective option for power generation. Here, one of its champions describes an industry with wind in its sales

It takes a stiff upper lip not to smile when Don Quixote almost falls off his horse in fright after mistaking a windmill for a giant. But perhaps the unlikely hero of Cervantes' literary masterpiece can be credited with foresight. Today's windmills, dubbed wind turbines, dwarf their predecessors, as their steely arms slice through the air at heights of up to 100 metres. More and more of these giants sprout on land and at sea, and they are gaining new ground in the marketplace. And while at present wind power provides just 0.15 per cent of the world's total electricity, it has become the fastest growing form of energy production.

The basic principles of wind energy have been known for many centuries. The earliest references to windmills date back to 7th century Persia, but for many the image most closely associated with wind power is that which gave Don Quixote such a fright: a picturesque timber tower supporting four long cloth-covered sails rotating in the wind. Today's wind turbine consists of a giant propeller fixed on top of a tall metal pole. When it rotates, the propeller drives a generator which churns out electricity that can either supply nearby users, possibly in an isolated rural community, or alternatively be sent down a cable hooked up to a central energy grid. One problem is that no way has yet been found of storing electricity to enable the wind's "ups and downs" to be evened out. The trend is for wind farms to move offshore, where their appearance and the sound of whirring propellers won't bother local communities, and strong and steady sea winds will keep the turbines turning at full force.

For the past 25 years, manufacturers have been streamlining components and installing on-board computers to tilt the propeller blades, for example, to suit particular wind conditions. In the early 1980s, the average turbine was 20 metres high with a 26-kilowatt (kW) generator and a rotor diameter of 10.5 metres. A typical turbine today may be perched 55 metres high, have rotors with a diameter of around 50-60 metres and a capacity of up to 1,650 kW. The amount of energy it can produce is equivalent to that consumed by about 350 European households.

Since 1992, more commercial wind farms have been installed in more countries than ever before. There are now 40,000 turbines in 40 countries, and the world's wind energy capacity is growing at nearly 27 per cent annually. In 1998, it topped 10,000 megawatts (MW), about the total energy producing capacity of a country like Denmark. The 1999 figures are not all in, but we know that 1998 was a boom year for the wind power industry. Equipment sales topped $2 billion and there were 35,000 jobs in the sector worldwide. Growth is expected to continue at about 25 per cent a year.

The prime motors of expansion are increasing environmental awareness and political commitments to reduce greenhouse gas emissions made under the Kyoto Protocol of 1997. Wind is free and supplies of it are inexhaustible, and when it produces energy it doesn't release heat or greenhouse gases.

The prime motors of expansion are increasing environmental awareness and political commitments to reduce greenhouse gas emissions made under the Kyoto Protocol of 1997. Wind is free and supplies of it are inexhaustible, and when it produces energy it doesn't release heat or greenhouse gases.

The European Union has taken the lead in rolling out the "green carpet" by introducing tax breaks and investment plans aimed at developing renewable energy sources such as wind power. There are plans to install 40,000 megawatts by the year 2010. Denmark, the wind energy pioneer, covers 10 per cent of its electricity consumption from wind power, delivered from an installed capacity of some 1,700 MW. Germany is quickly catching up, and is now the wind sector's fastest growing market (see article page 11). Spain, with its ample grazing lands and steady winds, is also soon likely to be attracting investment.

Rolling out a green carpet

The climate in the U.S. has been more volatile. Every two years, a congressional battle erupts around the renewal of an important tax credit to spur the industry. The same tumult rattles state legislatures that have their own credit schemes. According to U.S. energy secretary Bill Richardson, wind power should provide five per cent of the nation's electricity demands by the year 2020, compared to the current 0.1 per cent.

For the up and coming energy giants, notably India and China, interest in wind power has less to do with environmental awareness than with economics. These countries where broad swathes of the rural population are without electricity are keen to take advantage of wind investment plans offered by Denmark, Germany and the Netherlands. With nearly 850 MW installed capacity, India ranks first among developing countries and fourth in the world after Germany in the wind power league table. About 600 turbines are churning out 260 MW in China.

Asia and the Pacific used to be considered the coming hot spot for wind power. ▶

Managing Director of BTM Consult Aps (Denmark), a leading consultancy group specializing in wind power

► However, the region's financial crisis of 1998 knocked many energy investment plans off course, with the notable exception of New Zealand's Tararua Wind Farm—the largest in the southern hemisphere with a capacity of 12 MW.

Turbines are few and far between in South America, aside from a few installations in Costa Rica, Argentina and Brazil. Danish manufacturers are making some inroads into North Africa: Morocco recently installed 50 MW and Egypt 30 MW. The rest of the continent is in the doldrums, an unfortunate state of affairs given the tremendous need for renewable energy, especially in rural areas.

While the world's richest wind resources are found in North America, China and the former Soviet states, particularly those in Central Asia, we believe that wind power could provide at least 20 per cent of every continent's energy needs. There is enough wind to provide twice the expected global electricity demand for 2020. Even if only 10 per cent of energy needs were met by wind power, the world would be spared about 10 billion tons of carbon emissions (out of a total of 60-70 billion tons). To achieve this goal, 120 times more wind capacity would have to be installed than there is today. The initial investment required would be very high, but operation and maintenance costs would be marginal.

There is enough wind to provide twice the expected global electricity demand for 2020

Manufacturers today are building bigger and better turbines, and as a result wind-power prices have been falling at about 20 per cent over the past four years. In Denmark, for example, electricity generated by wind power cost almost 17 cents per kilowatt hour (kWh) in the early 1980s. The figure, which covers all costs (equipment, labour, interest on loans, operation and maintenance) fell to 6.15 cents by 1995 and has since dropped to about 4.6 cents. Meanwhile, electricity produced by the installation of a new coal-fired power plant would cost 5 to 6.4 cents kWh, 4 and 5.7 cents kWh in the case of a gas-fired plant, and 4.6 to 6.5 cents kWh in a nuclear facility, according to calculations by UNIPEDE, the European Utility Association.

But while the cost of wind-powered electricity will continue to fall in the future, competitive prices are not enough—there must be a political will to develop the market. Developing countries often find it difficult to raise the capital to cover the steep start-up costs of installing wind turbines. This is the downside of wind power. The initial costs of installing coal-fired plants, for example, are relatively cheap but fuel then has to be imported and in the long run this carbon-based energy will cost more than wind energy. If these countries are to develop an environmentally sound energy sector using wind power, they will need help in finding the initial investment.

The situation is radically different in North America and Western Europe, both of which have enough installed energy capacity to meet demand. In these countries the market for wind energy is driven by environmental considerations rather than economics. If governments do not adopt "green policies" requiring utility companies to close down classical power plants and switch over to renewable energy sources, the market for wind power will not be very dynamic.

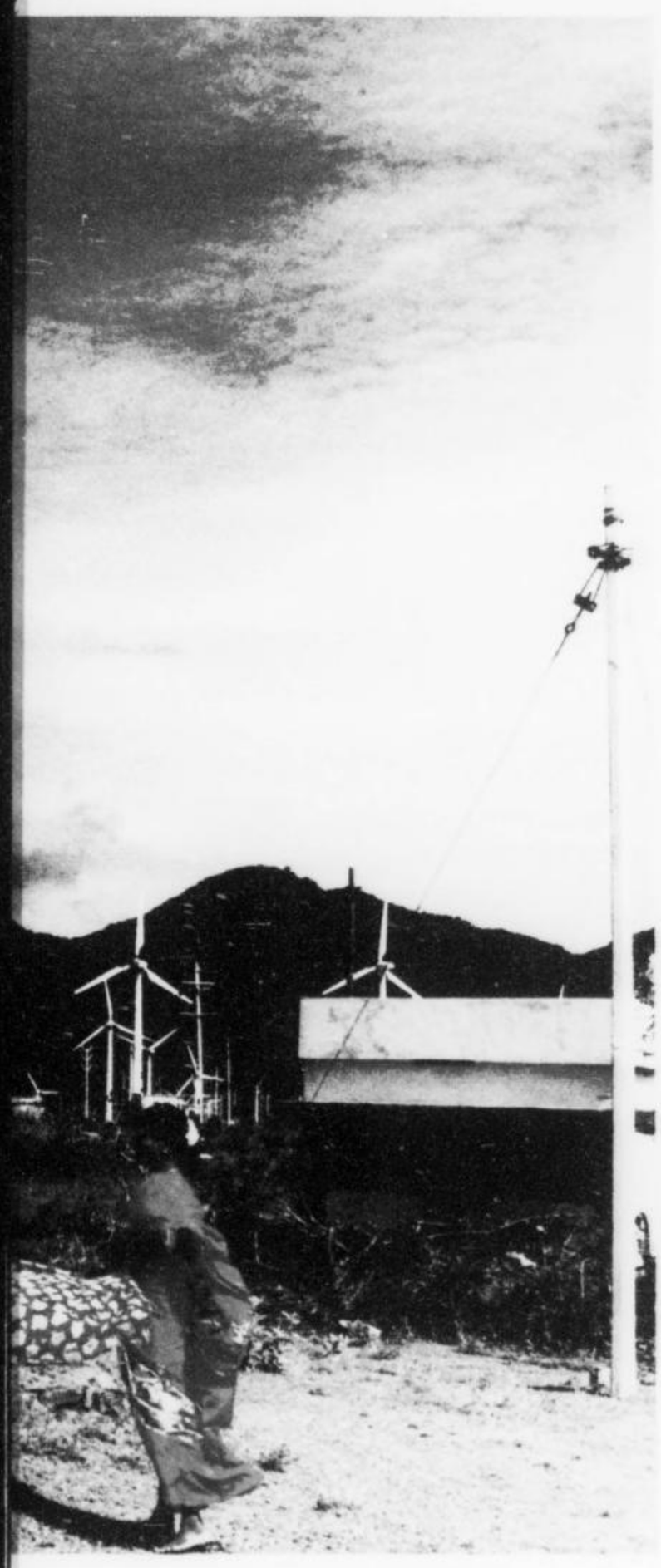
Green parties are stepping up the pressure on governments to promote clean energies by helping to fund R&D costs, for example. Other measures that could be taken include subsidizing electricity payments or offering tax credits and low-interest loans for manufacturers. The "polluter pays" principle might also be applied, with a special tax being levied on carbon-emitting energy producers, as opposed to a clean energy source such as wind.

A 'doped' market

Some argue that a truly promising energy source should not require government support. Others maintain that subsidies will do more harm than good by distorting the energy market and artificially boosting what remains an unpromising alternative. I would argue the contrary—that gas, coal, oil and nuclear energy have been "doped" on state subsidies from the start.

© Jay Ullal/Stern/Studio X, Limours

On a wind farm near Muppandal, Tamil Nadu (India) women dry their saris in the breeze.



GERMANY: TILTING AT WINDMILLS

Hartmut Wewetzer

Germany is the world's top producer of energy from wind power. But whether more wind farms should be built is sparking fierce debate

The north German plain is looking different these days. Where once fields, meadows and forests stretched as far as the eye could see, today the landscape is dotted with spectacular windmills, some of which tower 100 metres or more above the ground.

The further north you go, the more there are. In East Friesland (Lower Saxony) and on the west coast of Schleswig-Holstein (where windmills crowd the horizon) thousands of small businesspeople (Germany's association of wind energy producers has more than 6,000 members) have built huge wind farms to produce electricity for the national grid.

Since 1997, Germany has overtaken the United States as the world's leading producer of wind energy. It accounted for 700 of the 2,035 megawatts (MW) of new wind energy capacity installed worldwide in 1998 (the equivalent of the output of two large nuclear power plants). Each year, new records are set. In the first quarter of 1999 alone, 228 new wind turbines were hooked up to the national grid. The number of turbines in Germany rose from about 6,200 in January 1999 to 7,200 by the end of that year (3,750 MW).

But so far these devices produce only 1.3 per cent of Germany's electricity. The rest comes largely from fossil fuels (58 per cent), nuclear plants (36 per cent) and hydropower (5 per cent). The wind energy association predicts that by 2020 about 25,000 wind turbines will be installed, producing 30 per cent of the country's electricity. Government sources say that some 30 billion Deutschmarks ($1.8 billion) will be spent on strengthening the sector.

Wind power's success in Germany is partly based on public and media approval. Germany is the only Western country where nuclear power has, since the 1970s, met almost unanimous and often violent opposition. The anti-nuclear movement led to the birth of the Green party, which has been in government with the Social Democrats since the end of 1998. This coalition wants a rapid shut-down of nuclear power stations, although it has not yet reached an agreement with the energy distributors. If they fail to agree, a law may be passed to restrict the life of nuclear plants to 30 years, forcing the industry to close them one by one.

Global warming is another argument in favour of using wind power, a non-polluting energy source. Germany has pledged to reduce its greenhouse gas emissions by 21 per cent between 1990 and 2010. The public largely sees this as evidence of an "ecological revolution" and a new civilization where humans are at peace with nature.

Subsidized wind farming

The only problem—a big one—is that wind energy is very expensive. Extracting one kilowatt/hour of energy from the wind costs four times as much as using fossil fuels. So the political decision to develop renewable energy, taken by the previous government and reaffirmed by the present one, can only be applied if aid is available in the form of tax breaks for firms producing wind energy, low-interest bank loans, subsidies from the state and from provincial governments and favourable legislation. ▶

Many power companies using these fuels began as state monopolies protected by national legislation. They control the power grids. Often they bar new energy producers from the grids or impose rules which oblige newcomers to sell their energy at unfair prices. The development of wind power has also been hurt by the absence of legislation. For example, the UK has the best wind resources in Europe, but commercial attempts to set up wind farms in the last three years were stymied when local authorities failed to issue permits for turbine construction. Had the national government set up guidelines and policies inciting local authorities to co-operate, there might be more wind farms in Britain today.

The two notable champions of wind power are Denmark and Germany. Ferociously anti-nuclear, the public in both these countries studied their energy options before giving wind a "green light". Their diligence is now paying off at home and abroad, as their turbines blow a fresh breeze into global energy production. ■

Berlin-based journalist

© Emile Luider/Rapho, Paris

Wind power supplies these pyramid-shaped houses designed by architect Gerard Schouten at Huizen (The Netherlands).

▶ The 1991 "integration law", which is the key to the present system, obliges the electricity distributors to buy wind energy at guaranteed prices (90 per cent of the price paid by consumers), and this enables the wind farmers to make a profit.

But the growth of wind energy seems to be threatened by the opening up of the energy market, which started in April 1998 and has sharpened competition and reduced the price of electricity paid by consumers. This trend worries wind energy firms because they sell their product at prices which are specifically tied to consumer prices. With their profitability in jeopardy, they want more subsidies to protect themselves against the ups and downs of the market.

Meanwhile, opposition to wind power is growing. A few years ago, it chiefly came from the electricity distributors, who campaigned to have the 1991 law declared unconstitutional. They failed but managed to get it amended to limit their obligation to buy wind energy, which now comprises a maximum 5 per cent of the electricity they purchase. But in some parts of northern Germany, this quota is not enough to absorb the output of wind energy, and producers are looking for other outlets. A proposed new law would be even more advantageous to renewable energy than its predecessor in that it would abolish the 5 per cent rule.

The fiercest opponent of wind energy, Prof. Otfried Wolfrum, from Darmstadt, thinks that to continue backing wind energy is "a disastrous stupidity for the environment, for human beings and the economy". The current policy, he says, will in the coming years produce a loss of about 30 billion Deutschmarks (around $15 billion), which consumers will pay for in the form of electricity costing more than it would if the distributors were not forced to buy wind energy. He says wind farms are simply "a licence to print money".

He and other economists argue that subsidized wind energy may be creating jobs now but will end up cutting down on them. (Unemployment in Germany is over 10 per cent.) If energy prices are not competitive in Germany, they say, some electricity firms will move their plants to countries where conditions are more favourable. On top of this, these "appalling machines" are a blot on the landscape in important tourist areas. Wolfrum, the founder of Germany's League to Protect the Countryside, has made himself spokesman for a citizens' movement that is growing fastest in areas where wind turbines are most common.

Wind energy has become the centre of a major battle in Germany. Wolfrum's strong attacks, contained in his book "Wind Energy, a False Alternative", have provoked an equally strong riposte. An influential member of the lower house of the German parliament, Hermann Scheer, a wind energy lobbyist who received the 1999 Right Livelihood Award, also known as the Alternative Nobel Prize, recently even accused Wolfrum of using "fascist" arguments, which gives a good idea of how heated the debate has become. Scheer, working with journalists and environmental campaigners, has published a reply to his opponent's book called *Windy Protest*.

The fiercest opponent of wind energy, Prof. Otfried Wolfrum, and other economists argue that subsidized wind energy may be creating jobs now but will end up cutting down on them. If energy prices are not competitive in Germany, they say, some electricity firms will move their plants to countries where conditions are more favourable.

Despite these polemics, the rapid development of wind energy seems set to continue. In case public anxiety about harm to the countryside increases, wind energy entrepreneurs are planning to build wind farms out at sea. The biggest is slated for a spot 35 km east of the Baltic island of Rügen and will comprise 200 turbines capable of generating 1,000 megawatts. This is roughly the output of a big nuclear power plant, says a spokesman for Winkra-Energy, the company concerned, "and from the shore, you won't be able to see a single windmill." ■

QUIET PLEASE! CHILDREN TALKING

Silvia Bacher and Monica Beltran

Armed with microphones, tape recorders and cameras, the schoolchildren of Buenos Aires are learning to express their opinions and look at the news with a critical eye

The teacher asks her pupils to listen to the tape of a radio news item in which a government official says immigrants are to blame for other people being out of work. The statement makes a strong impact. The children, fifth grade pupils at a school in the Parque Avellaneda district of Buenos Aires, fall silent. Then Amparo, a 10-year-old Bolivian girl, speaks up. "When I was in hospital," she says, "they didn't want me to stay. They shouted at my mother and said: 'go back to your country.' They didn't give my father a job because he's Bolivian."

The news story, and Amparo's reaction to it, gave the children the idea of choosing "Immigrants at School" as a topic for their radio broadcasting workshop.

"We chose the subject because most of the children here are Bolivian," says the school librarian, Fany Opino. "The first thing we do is collect information. Then we rehearse the programme before it goes on the air. But the most important thing is that the children not only think about a situation they come up against every day, but that they feel they're being listened to."

The radio workshop is part of a Media Production in Schools scheme started up 10 years ago by the Journalism, Communications and Education Committee of the city of Buenos Aires. The scheme is known as the child journalist project but its aim is not so much to train young reporters as to increase the children's capacity to express their opinions and to use the media to help them to think for themselves.

For the "Immigrants at School" workshop, the children were asked to go out and interview immigrants, in some cases their own relatives. They wrote up their reports, read them out in class and discussed them. Then they collected material about racial discrimination from books and magazines. Finally, they worked out a structure, chose some music and put their radio programme together.

In the child journalist scheme, the process whereby children investigate, discuss, defend their opinions and listen to others, is more important than the end product, whether it be a newspaper, a video or a radio programme. In other words, the school is given the key task of training citizens who can think critically about the world they live in. "The workshop on immigrants helped me to understand why people sometimes shout at me in the street," says Maria Esperanza, another Bolivian pupil.

According to the teacher, making the radio programme enabled the children to know what it feels like to be rejected because of skin colour or place of origin. It also taught them to look at radio and television news with a critical eye and, through their own communication media, ▶

Respectively communication and education specialist and Buenos Aires-based journalist

"Keep the presses rolling!" Media workshops in Buenos Aires schools have mobilized tremendous enthusiasm.

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Budding journalists choose photos for their school newspaper and learn about page layout.

► to protest against the plight of those who feel victimized.

Producing radio programmes and magazines is a well-established activity in many countries' education systems. The Argentine programme has some unique features, however, because of the political and social context in which it developed in the late 1980s. The long years of military dictatorship and censorship had instilled a culture of silence into Argentine society. Within communities, the lines of communication were broken or frayed. The media production project seemed to be a good option for strengthening democratic practices via the school and for repairing the social fabric by building bridges between the school and the community and teaching children to interpret critically messages transmitted by the media.

Breaking the culture of silence

This objective may well be the key factor in the success of a programme which has managed to survive both lack of funding and political vicissitudes. In 10 years, the number of schools involved has grown from 34 to more than 200, most of them in poor neighbourhoods of Buenos Aires. About 50,000 children, mostly of primary school age but also some older children and some in special schools, have worked as reporters, editors, announcers, picture or film editors, researching, planning and producing more than 600 school magazines, 700 hours of radio programmes broadcast by local radio stations and about 100 videos.

The fact that the topics covered by the workshops are suggested by the children themselves and reflect their interests and needs is in itself a small revolution. Titles such as "From junior to senior", "Generation 2000" and "From caning to caring" give an idea of the subjects that most interested these budding journalists: relations with adults, human rights, violence, ecology and discrimination.

Some topics are directly related to the school curriculum (the role of women in history, mathematics, climate change and health care); others focus on community problems and lead to specific action.

Children who took part in one journalism workshop, for example, were worried about the disappearance of trees near their school, so they carried out a "tree census" in the neighbourhood. They interviewed the oldest residents, talked with experts and officials, and expressed their concern in a video made for the community. Then they launched a campaign to replant the area with trees.

Other children made a video about the rights of children "so that adults know more about us and don't mistreat us." This led them to take an interest in the lives of street children, some of whom they interviewed to find out how they managed to survive.

Workshop activities can also be purely creative and artistic. The presence of a Ukrainian child among sixth-graders at a school in the Caballito district gave the children the idea of collecting information about Slavonic history and culture. Next, they decided to create a puppet show based on Stravinsky's ballet *Petrushka* and to video it. "They researched the composer's life and work, went to see some ballet and, helped by craft and science teachers, made the puppets and wrote the script," says the school's music teacher, Lucia Salgado.

One of the biggest and most persistent obstacles to changing the old education model is the lack of properly trained teachers, and so theoretical and practical teacher training has been made a key element in the child journalist scheme. Once a week over two months, groups of interested teachers get together to produce and discuss media material with the help of a colleague who has classroom experience of the scheme. With UNESCO support, the programme has since 1994 built up a network of 350 teachers with special skills.

New horizons for teachers

Participants say the media workshops help them to recover their appetite for enquiry and learning in a school context which is by and large unexciting. For the children, they mean greater freedom and more contact with real life. "The workshops allow us to interview people and go out into town, while in the classroom we read and study to pass exams," says one young reporter. They open new horizons for teachers like Monica, who described how she learned to have more respect for the children's experience and realized that she had no monopoly on wisdom. "The workshop enables us to break free from stereotypes and find out things for ourselves," she says.

Teachers taking part in the experiment agree that producing radio programmes and newspapers is a good way of fostering children's verbal and writing skills since it doesn't involve reciting a lesson from memory but getting across personal ideas and opinions clearly and effectively so that readers and listeners outside the classroom can grasp them. The school newspapers the children produce, either in the form of a single sheet or a magazine, are distributed in the school and the

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- ***Producción de medios en la escuela. Reflexiones desde la práctica.*** **Coordinación de Periodismo, Comunicación y Educación, Secretaría de Educación, Gobierno de la Ciudad de Buenos Aires, 1998.**
- **Internet: http://www.buenosaires.gov.ar/educacion/chicosperiodistas**
- **sbacher@rocketmail.com**

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When they are given a video camera and sent out on an assignment, young people can find out for themselves how journalism works.

neighbourhood. The videos they make are usually shown at school festivals and other special events that parents and neighbours can attend. Since 1994, radio programmes have been broadcast weekly on FM community stations as part of a series called "Kaleidoscope: Children's Voices."

Learning to decode media messages

The purpose of the Buenos Aires scheme is not to set schools against the media but to channel the natural enthusiasm of children and teenagers. Latin American children spend an average of four hours a day watching TV or listening to music on the radio. Argentina's Educational Television Foundation discovered that out of 10.5 million households, 9.5 million have a television set and more than half of them are signed up with some kind of pay-TV, making Argentina number three in the world in terms of cable TV subscribers.

By the time children get to the age of 16, they're spending about 46,000 hours a year sleeping, 22,000 watching TV and 13,000 at school. "Television became the main cultural activity of the 20th century," says Sara Critto, the head of the Foundation. "But schools don't take account of this and children aren't properly prepared for it."

The most influential media in Latin American countries—radio, TV and the written press—are often controlled by small but powerful groups which usually obey economic interests and pay little regard to the citizen's right to information. What's more, the social context leaves little time for the clash of ideas and provides meagre access to sources of information outside television and radio. This sometimes produces audiences addicted to certain editorial approaches which sacrifice accuracy to newsiness.

But using the latest computer or a film camera doesn't necessarily sharpen the critical faculties. Technology cannot replace the teacher, whose role should be to help children analyse the news. By producing informative material, children learn how to accept the existence of conflicting viewpoints, distinguish opinion from facts and objectivity from sensationalism, and find out how to attract a reader's or listener's attention.

All these experiences help children understand the nuts and bolts of communication from the inside. They soon realize that a news story is not the same thing as "the facts" but a compilation that is rarely 100 per cent objective because it depends on who is doing the reporting. The American essayist Alvin Toffler has said that to prevent children becoming passive receivers and to teach them how to decode media messages, "the best thing is to give them video cameras and send them out to film something by themselves. They will soon learn to interpret the media in a critical way. They'll also find out how easily images and ideas can be manipulated, how to spot hidden advertising in entertainment programmes, and see how politicians use demagogic pictures and opportunistic poses."

Media programme production will not become widespread in Latin American schools until political leaders are convinced of the need for them and the reluctance of the schools is overcome. The impact of the media is so great that schools cannot stand by and do nothing. Whether teachers like it or not, the media are in competition with schools as agents of socialization.

Teachers should realize that although they have little money to buy new equipment and although there are many obstacles to tackling extracurricular subjects, the media and new technology can be their allies and schools are the most suitable place to teach children how to master media skills, interpret media messages and equip children to question them. ■

AN INTERNATIONAL NETWORK

Argentina's budding journalists have colleagues in other countries including France, Chile, South Korea, Switzerland and Benin. Working together, these young reporters put out a weekly magazine for children called *Fax!*, which was launched in France in 1989 by the Centre for Liaison between Teaching and Information Media (CLEMI).

Each issue is put together by a group of children from a single school who organize an editorial team, draw up a table of contents around a general theme and commission articles from young correspondents in different countries. The contributions are sent in by fax.

The editors responsible for the issue take charge of the magazine's design and its distribution by fax to the participating schools, which use it in language lessons. Each number of *Fax!* is produced in two languages, though not always the same ones.

Judging by the headlines and contents, some of the topics chosen by the young journalists would be the envy of quite a few of their adult colleagues. For example, schoolchildren in the Romanian town of Timisoara produced in 1999 an issue called "Different but not indifferent." Children in Guadeloupe, aware of the need to teach by example, printed their issue, titled "The environment: we're all responsible", on recycled paper.

Fax!, which is now up to its 170th issue, is aimed at children between 11 and 18. It also produces an edition called *Fax Junior!* for 6-to-11-year-olds who are taking their first steps in written journalism. ■

Centre de Liaison de l'enseignement et des moyens d'information (Centre for Liaison between Teaching and Information Media [Clemi]), 391 bis rue de Vaugirard, 75015 Paris, France.

Focus

Education for all
Schools reach out

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Education is a right and one of the most decisive tools for escaping poverty, but today there are still over one million children who do not make it into school and close to 900 million illiterate adults. Why? Education systems remain overly rigid and commitment by the state alone, in particular a financial one, is inadequate to reach the excluded. Ten years ago, the World Conference in Jomtien (Thailand) affirmed that education could not reach everyone unless it became everybody's business. It required new partners and an expanded vision. Ten years later, how do things stand?

This section opens with five flagship projects illustrating the "Copernican revolution" that UNESCO Director General Koïchiro Matsuura calls for. Uganda has tripled enrolment in primary school by combining mobilization at the top with delegation to the local level. In El Salvador, parents are co-running schools in rural areas. A Bangladeshi NGO has managed to educate over one million children, most of them girls. Ten million Indian volunteers are giving a new impetus to literacy work. In Mongolia, radio programmes provide new job skills to a dispersed population. "Give private initiative more responsibility, more space, more freedom," says Sanjit Bunker Roy, father of the Barefoot College in one of India's poorest states. The advice merits our attention given the uneven record of the past decade. Literacy remains education's poor relation, as Mohamed Maamouri of the University of Pennsylvania underlines. Without true reciprocity, partnerships remain a hollow concept, both at the national level (Mark Bray, Hong Kong University) and between Northern donors and developing countries (Kenneth King, Edinburgh University). And without bold initiatives, education will continue to widen rather than reduce the gap between rich and poor, concludes Harvard's Fernando Reimers. ■

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Editorial

A Copernican revolution

Koïchiro Matsuura

Ten years ago, the World Conference on Education for All held in Jomtien (Thailand) pledged to guarantee five years of primary education for every child in the world and to halve the adult illiteracy rate by the year 2000. These were ambitious objectives.

The World Education Forum to be held at Dakar in April will take stock of what has been done to achieve these goals during the last 10 years. In absolute terms the number of children not enrolled in primary schools and the number of adult illiterates have slightly declined. Because of demographic growth, the decline is more pronounced expressed in relative terms.

But figures are only part of the balance-sheet. The Jomtien Conference maintained that education is not only a right but also the key to all development. This conviction is now universally accepted, and so is the urgent need for schools to reach out, especially to all those still excluded by traditional forms of education. New partners (communities, NGOs, local civil and religious authorities and the private sector) are proving to be invaluable. Above all, objective analysis of the state of basic education which emerges from the country reports prepared for the Dakar Forum will allow a very precise diagnosis of the situation to be made for the first time.

A radical change of course

Paradoxically, the failures that have been recorded during this decade of action have taught a key lesson: more of the same will not be enough; different approaches will have to be adopted. Unless there is a radical change of course, education for all will remain a vain objective both in quantitative and qualitative terms. Basic education will only become accessible and relevant for all if there is a "Copernican revolution" in schools and schooling.

It is a truism that the capital on which every society draws to shape its future consists of the knowledge at its disposal and its capacity to extend and transmit that knowledge. In the age of the Internet and globalization, however, it is important to emphasize the growing contradiction between the new demands made by "knowledge societies" and the immobility of the major systems whereby knowledge is acquired.

These systems are chiefly based on a single period of time (whereas education should be a lifelong process) a fixed place (one to which many potential learners lack access), a specific group of actors (thereby neglecting the contribution that other segments of society can make), uniform content (whereas education should affirm cultural diversity), and a single source of funding (whereas public spending on education is not keeping pace with the inevitable increase in the cost of basic education and lifelong education for all). These structures, programmes and methods are increasingly being overtaken by the radical developments that are changing the face of all societies.

To lose sight of this approach, to stress the "all" in "education for all" to the detriment of "education" would lead to the growth of a new kind of illiteracy and an increase in the disparities and inequalities against which education should be the most powerful weapon

The contours of the revolution we shall be required to carry out are starting to take shape. The purpose of education can no longer be reduced to the transmission of learning or the mastery of job-related skills. We must not forget that "Education" literally means "drawing out", enabling learners to achieve their full potential. To lose sight of this approach, to stress the "all" in "education for all" to the detriment of "education" would lead to the growth of a new kind of illiteracy and an increase in the disparities and inequalities against which education should be the most powerful weapon. ■

Director-General of Unesco

A global campaign

Cynthia Guttman

Voices are rising up around the world to make governments keep their word on basic education in the years ahead

Enough is enough. Around the world, NGOs are on the campaign trail to pressure governments and donors into keeping the promises they will make at an upcoming international conference on education in Dakar (Senegal)[1].

Their concern: progress since the World Conference on Education for all held at Jomtien (Thailand) in 1990, where governments committed themselves to an expanded vision of education and a set of goals (see box), has fallen short of targets set. "Whereas we emerged from the Cold War and the risks of military conflict decreased compared to the 70s and 80s, we did not use this margin of manoeuvre as we could have. History gave us this opportunity and we did not take it," says Elie Jouen of Education International, one of the world's largest teachers' organizations and a partner in the campaign.

Spelling out solutions

"We are worried that Dakar is going to turn into another talking shop where everyone reaffirms things already agreed, sets new targets and then, as after Jomtien, goes home, cuts the aid budget and allows debt problems to continue undermining education systems of Third World countries," says Kevin Watkins of Oxfam International, author of a hard-hitting report on education and poverty (see box p. 36). "For these conferences to work, you need to create a public perception that there is a serious problem which people have to tackle. And you have to come up with solutions."

The campaign reflects not only the rising involvement of NGOs in education, but also their emerging role as a watchdog with formidable advocacy tools. And they have realized that to be effective, they have to act in numbers. The founders of the campaign launched last October encompass a broad range of interest groups: Education International, the Global March against Child Labour, and development aid agencies ActionAid and Oxfam. At the grassroots, initiatives from rallies to media campaigns and consultations with ministry officials are being conducted in over 60 countries. Community organizations are working on national reviews to ensure that the voices of civil society groups are heard. More broadly, the campaigners are urging governments to take a hard look at their education strategies and spell out the steps required to meet commitments.

At the international level, the campaign is lobbying for deeper and quicker debt reduction, reform of structural adjustment policies and increased aid. In some countries, it may be a question of reallocating resources. In others, especially in sub-Saharan Africa, countries cannot fill the resource gaps alone. Best estimates suggest that it would cost about $8 billion extra a year to achieve universal primary education, a sum equivalent to about four days' global military spending.

While praising the advocacy powers of this coalition, many caution against singling out the resource issue. "In many countries, it's just as much a question of good governance and making better use of existing resources," says UNESCO's Sven Osttveit. Aïchah Bah Diallo, director of the division of basic education at UNESCO, stresses that governments who have made a difference are those with an education policy "that sells." This, she asserts, can only come about through partnerships not only with other ministries but with the society at large, especially teacher trade unions and the media. Next, "you need transparency, and for this, a stop to corruption." That being said, Osttveit regrets that the Jomtien Declaration failed to specify global financial targets. Nor will Dakar. The danger is that pledges without resources run a high risk of ringing hollow. Hence the critical role of public opinion in defending basic education as a right and a key to escaping the trap of poverty. ■

Education is the most powerful weapon which you can use to change the world.

Nelson Mandela, South African statesman (1918-)

The 1990 Jomtien conference established six key goals:

- expansion of early childhood care and development, especially for the poor
- universal access to and completion of primary education by the year 2000
- improvement in learning achievement based on an agreed-upon percentage of an age group attaining a defined level (e.g., 80% of 14-year-olds)
- reduction of the adult illiteracy rate to half its 1990 level by 2000, with special emphasis on female literacy
- expansion of basic education and training for youth and adults
- improved dissemination of the knowledge, skills and values required for better living and sustainable development

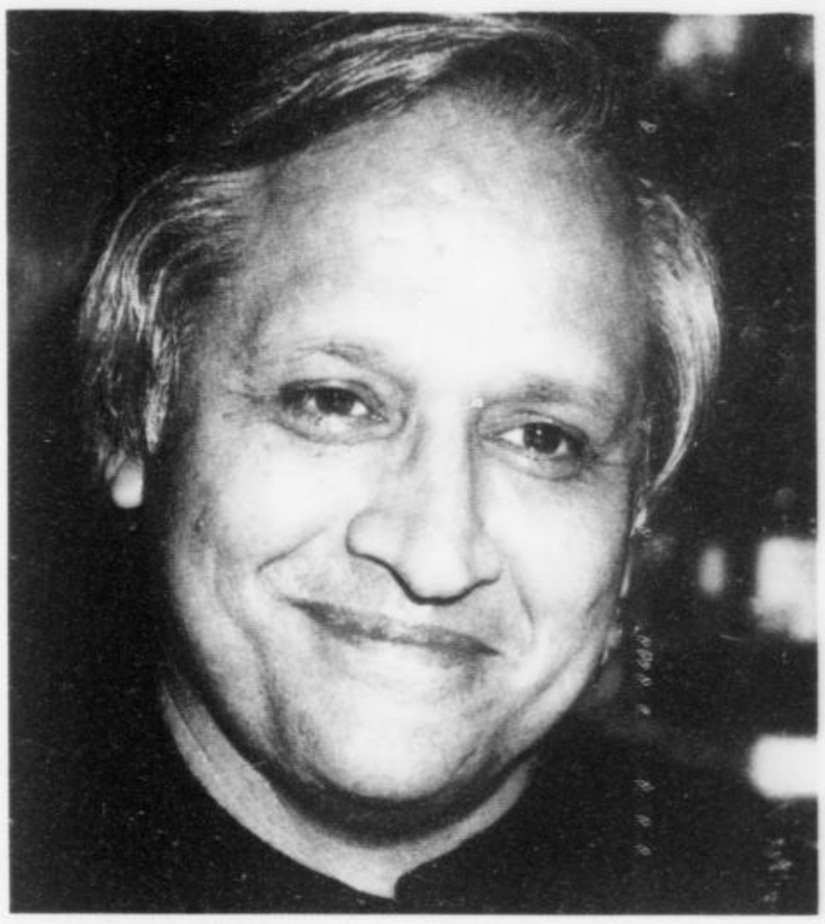
UNESCO Courier journalist

1. The World Education Forum, to be held April 26-28, 2000.

India's Barefoot College generation

Neelesh Misra

Educator Sanjit Bunker Roy has found that tapping local wisdom and initiative can help villagers achieve empowerment



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Sanjit Bunker Roy

When Sanjit Bunker Roy came face to face with a devastating famine that killed thousands in the Indian state of Bihar over 30 years ago, his vocation was suddenly sealed. It would not be in the city but in the countryside, it would not be in the upper echelons of the civil service but at the grassroots, with the village people.

Since founding the Social Work and Research Centre in 1972, Roy has been living in Tilonia, a village in one of India's largest, driest and poorest states, Rajasthan. Better known as the Barefoot College[1], the centre has trained two generations of villagers without any formal paper qualifications to become health-care workers, solar engineers, handpump mechanics and teachers in their communities.

Thanks largely to its efforts, over 100,000 people in 110 villages now have access to safe drinking water, education, health and employment. Rural youth once regarded as "unemployable" install and maintain solar electricity systems, hand pumps and tanks for drinking water. At special workshops, young artisans upgrade local skills acquired through generations. And on an average evening, about 3,000 children (60 per cent of whom are girls) who spend their days grazing cattle and helping their elders make their way to night school (there are now 150 of them around Tilonia), taught by local residents with rarely more than eight years of schooling.

The project's success is proof that sometimes an outsider's view can be a lasting catalyst for development. Since graduating from New Delhi's St Stephen's College, one of India's most prestigious educational institutions, Roy has devoted his life to Tilonia and bettering the conditions of the rural poor. It was a radical move: "If someone wants to do work in a village, the formal education system discourages him," asserts Roy. "The mindset that this system inculcates in students is that going back to the villages is a losing proposition. Remaining in the city is considered a success."

Roy looks upon the Barefoot College as a multiplier force that uses traditional knowledge as a tool to reach the goals that conventional government policies have often been unable to achieve. Twenty Barefoot College field centres can now be found in 13 of India's 26 states, and the expansion is set to continue. "The idea is to use local wisdom before we involve expertise from outside," states Roy.

In Tilonia, education and development are inextricably linked. Youth are trained to use technologies that serve their communities while children learn about environmental themes such as solar electricity, which is used in most of their schools. "Night school students learn from resource persons who are not only their teachers, but also farmers, policemen, or local officials," explains Roy.

For Roy, taking some of the responsibility for education out of the hands of government could speed up progress towards universal primary education in his country. "Encourage private initiative without commercializing education. Give private initiative more responsibility, more space, more freedom," he says. As things stand now, the formal system alone cannot answer the challenge of rural education. "It destroys initiative and creativity. It expects you to do everything the way they say, the way they do," he says. The starting point is to understand the reality of the rural poor—"about 60 or 70 per cent of children never go to school in the morning because they are supposed to work and rear cattle"—and to channel these children into vocational training at an early age so that they can gain new skills while continuing to help their families.

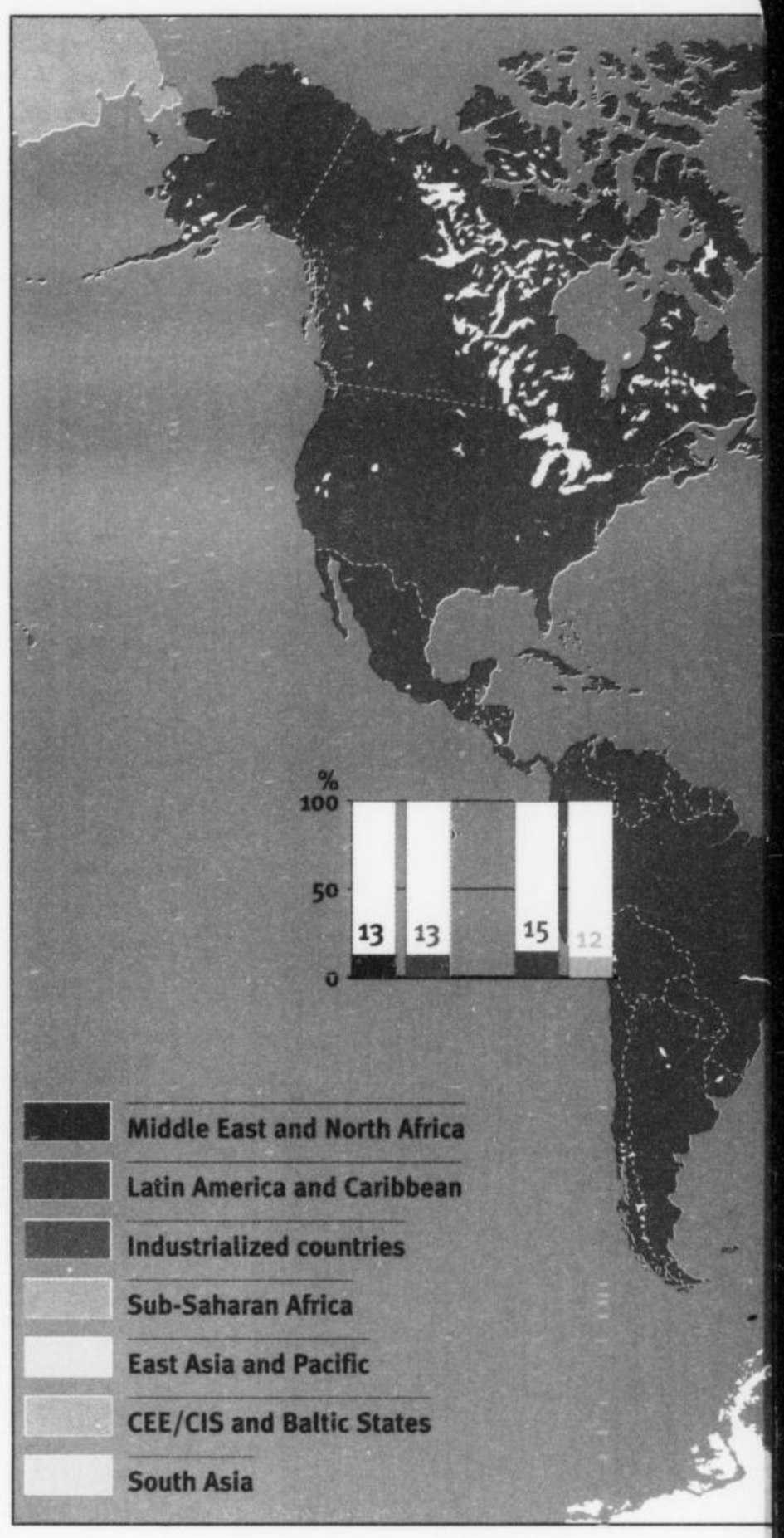
If Roy feels that creativity is not always the strength of government, the Barefoot College is breeding its own generation of committed and politically minded individuals: in Tilonia, it is the children's parliament, an elected body of girls and boys between 10 and 14 years of age that is responsible for making sure that schools are run properly—an ingenious way of giving children a hold on their own lives—and that of their villages. ■

Journalist based in New Delhi (India)

1. The centre is funded by the government of Rajasthan (40 per cent), international donors (40 per cent) and its own activities (20 per cent).

Basic education: gaps on the map

An overview of world education trends highlights glaring inequalities



A decade after governments and the international community pledged to ensure universal access to primary education by 2000 and to reduce the adult illiteracy rate to half its 1990 level, there are still around 130 million children in the world who never attend school and an estimated 872 million adults who do not have the most basic skills to break their way out of poverty. The education crisis is most flagrant in the two regions with the lowest per capita incomes in the world, South Asia ($385) and sub-Saharan Africa ($513). In the latter, sixteen countries have suffered a decline in enrolment rates.

To put the crisis in perspective, it should be noted that in 1960, fewer than half the developing world's children aged 6 to 11 were enrolled in primary school, compared with 79 per cent today. But these tremendous efforts were insufficient to match population growth while the debt crisis of the 1980s in many cases arrested progress. Over the past decade, net enrolment ratios have been inching up slowly (from 53 per cent to 56 per cent in sub-Saharan Africa, from 65 to 72 per cent in South Asia). Public expenditure on education has crawled up from 5.1 to 5.6 per cent of GDP in sub-Saharan Africa and from 3.9 to 4.3 per cent in South Asia.

The gender trap

Girls crowd the ranks of out-of-school children disproportionately, representing nearly two of every three children in the developing world who do not receive a primary education, according to UNICEF. Half the girls in sub-Saharan Africa and South Asia never attend school, with the highest disparity found in the latter region (15 points). The Middle East and North Africa have much higher enrolment rates, but the gender gap in primary education remains significant (8 points).

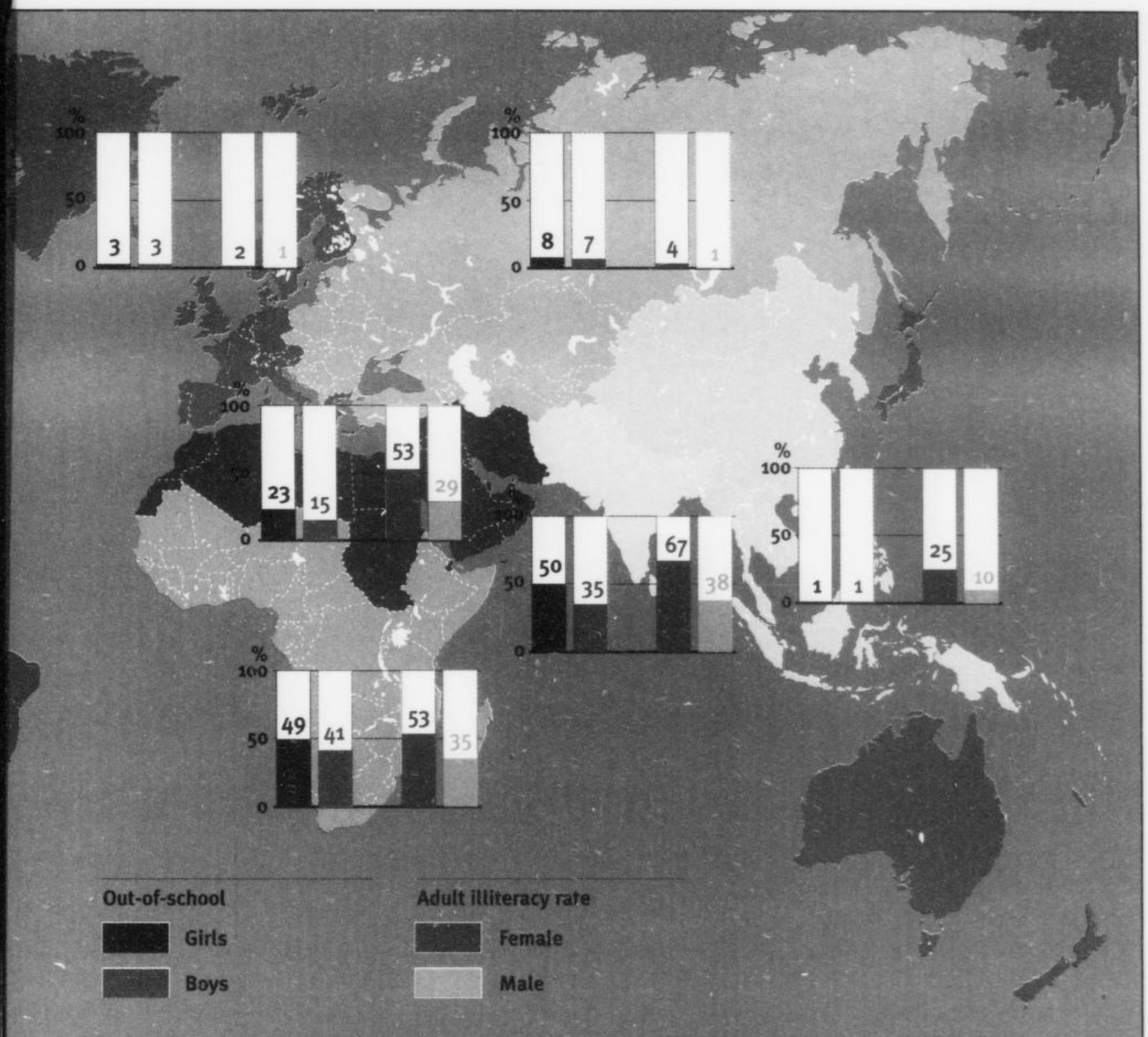
These inequalities at the primary level naturally go on to swell illiteracy rates: in the same three regions, over half the female population over 15 years of age is illiterate, with South Asia posting the highest rate and the most glaring gender gap (29 points). This situation has particularly critical implications for human development given the beneficial impact of several years of primary education on decreasing infant mortality and reducing fertility rates.

But there are other inequalities aggravating the situation. Although many countries in the developing world are predominantly rural, education is frequently skewed in favour of urban children: Burkina Faso and Niger are extreme cases, with primary school attendance over 40 per cent lower in the countryside than in urban areas.

Another major cause for concern is not reflected on this map: the number of children who actually finish the primary school cycle. In South Asia and sub-Saharan Africa, between 30 and 40 per cent of children entering primary school drop out before reaching grade five without acquiring the basic skills enabling them to improve their lives and have a voice in society. The problem is equally troubling in regions where most children go to school: in Latin America and the Caribbean, one quarter of the children entering primary school drop out before reaching grade five. ■

The illiterates of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.

Alvin Toffler, U.S. writer and futurologist (1928-)



Percentages of children not enrolled in primary school and illiteracy rates, by sex and region

Source: UNICEF

Poverty is a woman sending her children out to beg in traffic rather than to school because otherwise there will be nothing to eat. The mother knows she is repeating a cycle that trapped her, but there is no way out that she can see.

Alicia Gentolia, urban social worker, Philippines

Glossary

Basic education encompasses early childhood and primary (or elementary) education for children, as well as education in literacy, general knowledge and life skills for youth and adults; it may extend into secondary education in some countries. It refers to education intended to meet basic learning needs, namely the knowledge, skills, attitudes and values necessary for people to survive, to improve the quality of their lives, and to continue learning.

Adult illiterate: a person 15 years or over who cannot read, write and understand simple written messages in any language.

Functional illiterates: adults with inadequate literacy skills to meet the demands of everyday life.

Illiteracy rate: number of illiterate adults expressed as a percentage of the total adult population (15 years and over).

Net enrolment ratio: the number of pupils enrolled who are in the officially defined primary school age-group, expressed as a percentage of the total population of that age-group.

The rural gap

Countries where primary school attendance in rural areas is lower than in urban areas by 15% or more, 1990-1995

	%
Egypt, Pakistan	15
Uganda	16
Cameroon, Rwanda	17
Ghana	19
Guinea, India	20
Côte d'Ivoire	21
Guatemala	22
Central African Rep., Haiti	26
Dem. Rep. of Congo, Yemen	28
Zambia	29
Madagascar, Nigeria	30
Senegal	33
Mali	34
Morocco	38
Niger	42
Burkina Faso	49

Source: UNICEF

Basic education: gaps on the map

An overview of world education trends highlights glaring inequalities

A decade after governments and the international community pledged to ensure universal access to primary education by 2000 and to reduce the adult illiteracy rate to half its 1990 level, there are still around 130 million children in the world who never attend school and an estimated 872 million adults who do not have the most basic skills to break their way out of poverty. The education crisis is most flagrant in the two regions with the lowest per capita incomes in the world, South Asia ($385) and sub-Saharan Africa ($513). In the latter, sixteen countries have suffered a decline in enrolment rates.

To put the crisis in perspective, it should be noted that in 1960, fewer than half the developing world's children aged 6 to 11 were enrolled in primary school, compared with 79 per cent today. But these tremendous efforts were insufficient to match population growth while the debt crisis of the 1980s in many cases arrested progress. Over the past decade, net enrolment ratios have been inching up slowly (from 53 per cent to 56 per cent in sub-Saharan Africa, from 65 to 72 per cent in South Asia). Public expenditure on education has crawled up from 5.1 to 5.6 per cent of GDP in sub-Saharan Africa and from 3.9 to 4.3 per cent in South Asia.

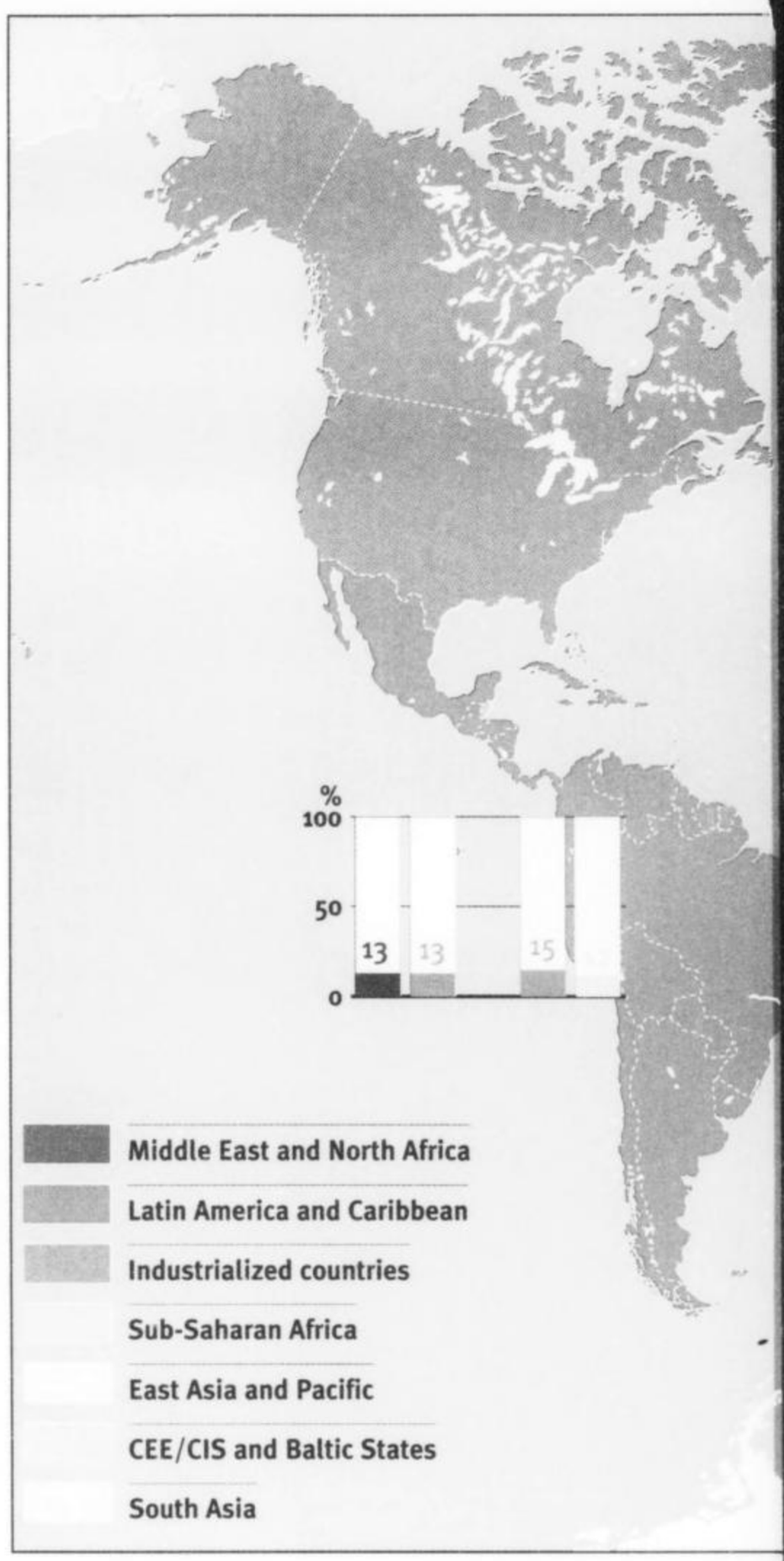
The gender trap

Girls crowd the ranks of out-of-school children disproportionately, representing nearly two of every three children in the developing world who do not receive a primary education, according to UNICEF. Half the girls in sub-Saharan Africa and South Asia never attend school, with the highest disparity found in the latter region (15 points). The Middle East and North Africa have much higher enrolment rates, but the gender gap in primary education remains significant (8 points).

These inequalities at the primary level naturally go on to swell illiteracy rates: in the same three regions, over half the female population over 15 years of age is illiterate, with South Asia posting the highest rate and the most glaring gender gap (29 points). This situation has particularly critical implications for human development given the beneficial impact of several years of primary education on decreasing infant mortality and reducing fertility rates.

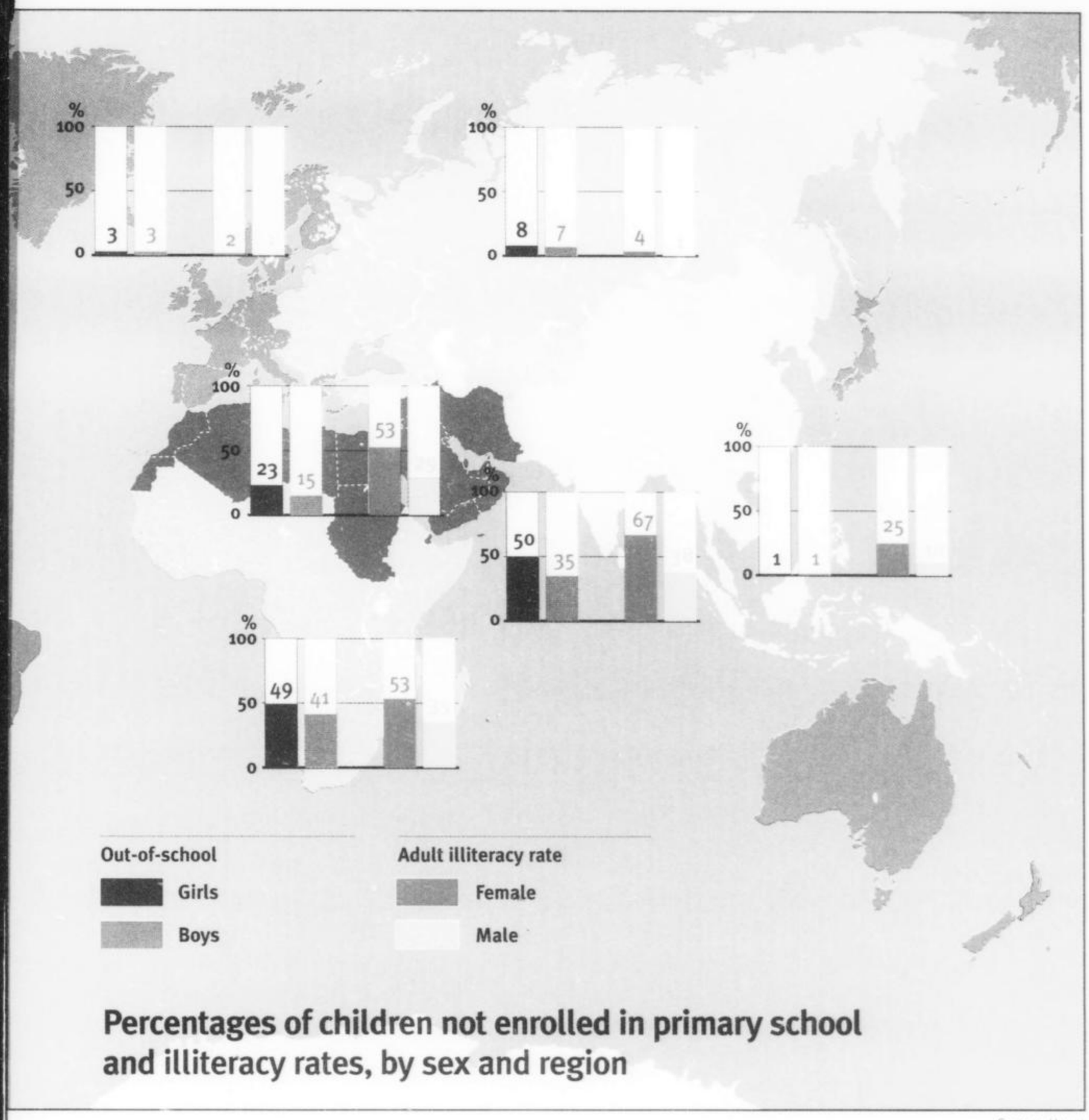
But there are other inequalities aggravating the situation. Although many countries in the developing world are predominantly rural, education is frequently skewed in favour of urban children: Burkina Faso and Niger are extreme cases, with primary school attendance over 40 per cent lower in the countryside than in urban areas.

Another major cause for concern is not reflected on this map: the number of children who actually finish the primary school cycle. In South Asia and sub-Saharan Africa, between 30 and 40 per cent of children entering primary school drop out before reaching grade five without acquiring the basic skills enabling them to improve their lives and have a voice in society. The problem is equally troubling in regions where most children go to school: in Latin America and the Caribbean, one quarter of the children entering primary school drop out before reaching grade five. ■



The illiterates of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.

Alvin Toffler, U.S. writer and futurologist (1928-)



Percentages of children not enrolled in primary school and illiteracy rates, by sex and region

Source: UNICEF

Poverty is a woman sending her children out to beg in traffic rather than to school because otherwise there will be nothing to eat. The mother knows she is repeating a cycle that trapped her, but there is no way out that she can see.

Alicia Gentolia, urban social worker, Philippines

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Countries where primary school attendance in rural areas is lower than in urban areas by 15% or more, 1990-1995

Source: UNICEF

Uganda's full school benches

Dan Elwana

Driven by strong political will and local involvement, Uganda has embarked on an ambitious programme to get all children into school by 2003

When a country decides that education is going to become a top priority, then mountains can be moved in a very short time. Uganda is a case in point. Since President Yoweri Museveni fulfilled his campaign pledge to provide free education for up to four children per family in 1996, enrolment figures have soared from 2.3 to 6.5 million primary-aged children.

As Museveni has often said, "If we are to industrialize, we need an educated population." The will to promote such a policy is rooted in Uganda's emergence from years of conflict during the seventies and eighties. Between 1971 and 1985, gross domestic product (GDP) declined, and education's share of it fell from 3.4 to 1.4 per cent—about four times below the African average. When the National Resistance Movement (NRM) assumed power in 1986, the education system had collapsed and the country had become one of the poorest in the world. The government immediately commissioned an in-depth analysis of the education sector, consulting widely with all stakeholders around the country. This process fostered a broad-based sense of ownership of the ensuing national education policy and paved the way for the declaration of the Universal Primary Education programme (UPE), officially launched in December 1996. The time frame for completion is 2003.

Granted, the country now boasts one of Africa's best performing economies, with real GDP growing at an average of 6.5 per cent since 1987. It was the first to be declared eligible and to benefit from the Heavily Indebted Poor Countries initiative in April 1998, with a fraction of debt relief allocated to education. Overall expenditure on primary education increased 40 per cent for the first year of UPE and another 28 per cent the subsequent year. Primary education now accounts for 64 per cent of the total education budget, up from 30 per cent at the beginning of the 1990s, and the programme is also benefiting from strong donor support. At constant prices, Uganda spent only US$8 annually per pupil in the early 1980s, compared to $32.50 in the financial year 1997/98.

"When the policy was announced, there was quite a bit of confusion at the community level," recalls UNICEF's Charles Nadongo. "It was thought that the central government was supposed to take care of everything. Now the policy has been clarified to ensure that all partners understand their roles." The policy coincided with the decentralization of several public services, notably putting schools under the management of the country's 39 districts. Sensitization and training seminars were held for local political and religious leaders, as well as administrative personnel, while radio programmes also greatly helped in clarifying roles. "Because of the decentralized nature of power, leaders are accountable at the local level and have a strong obligation to make sure it works."

The programme's hallmark lies in suddenly making education affordable for thousands of families. Before the introduction of UPE, parents bore the cost of school fees, were expected to provide uniforms, exercise books, textbooks and in some cases money for a building fund used by authorities for expanding school blocks or renovating existing ones. Fees alone could range from 35,000 to 45,000 Ugandan shillings ($23-$30) per school term. In a survey conducted in January 1997, 80 per cent of parents interviewed stated that lack of money had prevented them from sending their children to school. Under the current programme, school fees are waived and textbooks are free, but the rest of the deal is a cost-sharing one.

Government provides iron sheets, cement, timber and nails for building classrooms, with local authorities and communities expected to supply additional inputs. Parents must provide uniforms, pens and exercise books as well as help in managing

Journalist with *The East African* (Uganda), with additional reporting by *UNESCO Courier* staff

schools. "As parents, we provide voluntary labour and ensure that the materials sent by the central government are properly used," says Ahmed Sekandi, who is helping to reconstruct a school destroyed by war. In some cases, local councils are imposing an education tax to raise revenue for school development. School management committees have been strengthened and expanded to include teachers, parents and community representatives and are much more active than in the past according to Mary Kasozi, a World Bank officer.

Part of the programme's success is owed to a "new partnership between the government and the NGO sector," according to Albert Byamugisha of the Ministry of Education and Sports. In some cases, old alliances have been revitalized, especially with the churches, which were once the backbone of the education system. Church organizations have provided input into the new syllabus. According to the NGO World Vision, which is involved in education projects in 17 Ugandan districts, "The relationship between government and NGOs has greatly improved because the government officials now view the latter as a great asset."

In many cases, the funds previously used by NGOs to support tuition fees have now been released and earmarked for classroom construction, teacher training and help in providing lunches and uniforms. Technical co-operation with foreign donors has also been bolstered.

Although it is too early to assess their impact, investments are also being made in quality. Some 20,000 teachers have been hired, training has been boosted, notably through community-based programmes, and salaries have significantly increased, although most say that the current wage (U.Shs. 72,000/US$48 per month) is too low to make ends meet. A new syllabus is being developed which places greater emphasis on practical subjects such as agriculture, home economics, animal husbandry and environmental studies.

But considerable hurdles remain. There are not enough schools. The official pupil-teacher ratio is 63 (up from 37 in 1996), but it is not rare for primary school teachers to have to cope with classes of 150 pupils. According to World Vision, there is bitterness in urban areas because of overcrowding, and many families have started opting for private schools. The current strategic education investment plan (1998-2003) calls for the building of some 25,000 classrooms and the renovation of dilapidated buildings along with the establishment of community polytechnics to provide multi-skill training for primary-school leavers. Given present enrolment trends, it can be foreseen that students will run up against a shortage of secondary schools in a few years time. And even though the programme has opened up the school to new leagues of children, UNICEF expresses concern that this is not enough.

Girls' enrolment is only slowly inching up (47 per cent in 1999). "We estimate that there are about 15 per cent of children who are not making it to school. The curriculum and learning experiences have to be better adapted to vulnerable groups; otherwise the push-out effects will be great," says Nadongo. Efforts are underway to better cater to the most marginalized groups, in particular nomadic communities in the northeastern Karamoja region, where the UPE programme has had a minimal impact. Here, in partnership with government, NGOs and UN agencies are spearheading projects to make school fit in with the lives of children, and not the other way around. ■

It takes a village to raise a child.

African saying

© Ron Giling/Lineair, Arnhem

Primary school pupils at Mbarara in Uganda. Their school was built by parents using material paid for by the state.

Uganda: basic indicators

Population:
20.9 million
GNP per capita:
US$320
Literacy rate:
64 per cent
(female literacy rate: 53 per cent)
Net primary school enrolment:
85 per cent

Source: ADEA

Bangladesh: girls first

Shahnoor Wahid

From modest beginnings, an NGO attracts over one million children from poverty-stricken backgrounds into the classroom and gets them to stay there

Outside a one-room school in a village 40 kilometres from Dhaka, the Bangladeshi capital, a mother balks at the idea of marrying her 14-year-old daughter Mukta if a proposal comes along, even more at sending her to work in a factory to supplement the family income. "I'll never do such a thing. I want my children to get an education first," she asserts. "Education will help them get a good job later and become established in life. You can rob a person of all their goods, but not of an education."

Inside, Mukta is one of twenty girls and five boys sitting on mats arranged in a "U" shape on the earthen floor. Learners each have their own textbooks, notebooks, pencils and slates. Drawings, poems and rhymes, a map of Bangladesh, a calendar and a blackboard brighten up the bamboo walls of this modest classroom run by the Bangladesh Rural Advancement Committee (BRAC). Formed in 1972 to help thousands of refugees returning from the previous year's war,[1] this NGO has become one of the most influential in the country for its work in rural development, health and education.

Were it not for BRAC, it is more than likely that the children in this classroom—the sons and daughters of rickshaw pullers, small traders or factory workers—would never learn to read and write in a country where almost half the population lives below the poverty line. Despite progress in expanding primary education over the past decades, the poorest of the poor are still likely not to make it to school or to drop out in the early stages. BRAC launched its education programme in 1985 after a question from a mother enrolled in one of its adult literacy classes: "But what about our children? Will they have to wait until they are 18 to join your school?"

From modest beginnings with 22 experimental schools, BRAC's education programme now counts 34,500 schools catering to 1.2 million students, of whom 70 per cent are girls. Additional programmes for children between 11 and 14 and for those living in urban slums have also been launched in the past decade, and community-based libraries have been set up across the country. Between 1985 and 1999, a total of 1.5 million students graduated from BRAC schools. The model is being replicated in several East and South African countries and is inspiring in-depth primary education reforms in South Asia and Central America.

The visitor to BRAC schools in villages on the outskirts of Dhaka is immediately struck by the high attendance rate and percentage of girls in the classroom. One major asset of BRAC schools is that they are always located close to students' homes, distance being one of the chief impediments to girls' schooling in developing countries. Another plus is class size: there are never more than 33 students per class, compared with an average 73 in government schools. In some cases, schools run morning and afternoon shifts, with classes held three hours daily, six days a week. These are agreed upon with parents and can be changed during harvest time if necessary. House owners often volunteer to rent out a room to BRAC at minimal cost.

A confidence booster

Parents are met in groups by BRAC staff several times before a school is opened and are required to pledge to send their children to school each day and to attend monthly parents' meetings. Three parents (often mothers) also sit on the school management committee alongside the community leader and teacher. And when children don't show up at school for a few days, the teacher or supervisor goes to check on them. The curriculum essentially covers the same ground as in formal schools but is presented through simplified learning materials that are relevant to the life and environment of the children. According to Dr Ariful Islam, coordinator of the education programme, "the school hours, location, teacher and curricular activities like singing, dancing and drawing capture the students' interest and boost their confidence. Teachers and supervisors monitor the progress of each individual learner with care."

Teachers, the single most decisive influence on the quality of schooling, are what BRAC calls "paraprofessionals". Ninety-seven per cent of them are women—a key factor in attracting girl pupils. They generally have nine years of education, making them less qualified than their counterparts in government schools who are required to have finished secondary school. Most are married and live in the village where the school is located. Although their wages are below those in government schools, their status as teachers carries intangible benefits, such

Bangladesh: basic indicators

Population:
122 million
GNP per capita:
US$260
Literacy rate:
58 per cent
(female literacy rate: 35 per cent)
Net primary school enrolment:
81.4 per cent

Source: World Bank and Government of Bangladesh

Associate editor, *The Independent* (Bangladesh)

1. From 1947 until 1971, the federal state of Pakistan consisted of East Pakistan and West Pakistan, which were separated geographically. In 1971 East Pakistan broke away, and achieved independence as the People's Republic of Bangladesh after a civil war which lasted from March to December.

as recognition within the community. The recruitment procedure is straightforward and the accent thereafter is put on building skills and keeping motivation high: after being hired, teachers go on to take a two-week BRAC training course that is complemented by refresher training one day a month.

The results? BRAC schools boast a much lower dropout rate than government primary schools (8 per cent compared with 32 per cent). Almost 90 per cent of the students who graduate from them go on to the formal schools, passing admission tests with little difficulty and proving that non-formal learning is not synonymous with lower quality. Cost per student is a yearly $20, compared with an estimated $52 in government schools. Significantly, teachers' salaries account for less than 40 per cent of costs (close to 90 per cent in government schools), leaving more funds available for student books and supplies, curriculum development, teacher training, management and support at the local level.

Over the years, BRAC has won the confidence of parents, many of whom now claim in chorus that "these schools are better run than government ones, teachers come on time and students learn in one week what those in government schools do in a month." According to UNICEF's Manzoor Ahmed, "BRAC's non-formal primary education programme has the same elements as all other traditional or non-traditional educational programmes, but it is the character and composition of these elements that make it distinctive and are the key to its success." He underlines that BRAC "has exploded several widely held myths about primary education: that poor and illiterate rural families are not concerned about their children's education, that parents in traditional communities do not support education of girls and women, that only teachers with formal credentials and qualifications and expensively built school buildings provide the setting for quality primary education; that NGOs can be relied on for only small-scale pilot projects in primary education; and that serving hard-to-reach groups effectively makes schools more expensive."

Although the government has acknowledged that universal primary education can't be achieved without embracing non-formal avenues to learning, it gives no support to BRAC's programme. Cost-sharing negotiations are underway, but so far the organization remains highly dependent on a consortium of bilateral and multilateral aid donors. BRAC's education budget for the 1999-2004 period totals $112 million, of which $109 million will be funded through foreign donors. Since 1998, the organization has been asking for a 5 *takas* (around US10 cents) monthly contribution every month from each student, with an exception made for the most destitute families and the second child enrolled. This income covers about three per cent of total costs. BRAC's success however has not left the government entirely indifferent. It has turned over 67 poorly functioning community schools to the organization, with the hope that BRAC will get them running again. BRAC is also one of several NGOs which has received government funding to run 225 schools catering to children working in factories or as domestic servants, an initiative that is not part of BRAC's own non-formal primary education programme.

Although it has no plans to open new schools, BRAC is stretching its education programme to the full five-year primary cycle (instead of the present three)—to give the underprivileged an extra chance of getting an education. ■

© Ron Giling/Lineair, Arnhem

At a factory owned by the Bangladesh Rural Advancement Committee (BRAC), slates are packed for free distribution to children.

It is easy to substitute our will for that of the child by means of suggestion or coercion; but when we have done this we have robbed him of his greatest right, the right to construct his own personality.

Maria Montessori, Italian educator (1870-1952)

El Salvador: power to the parents!

Carlos Mario Marquez

To cope with the ravages of civil war, parents in some of El Salvador's poorest villages took over the running of local schools. The experiment has caught on nationwide

Like all of El Salvador's institutions, the school system suffered from the effects of the bloody civil war that ravaged the country between 1980 and 1992. When the war came to an end, half a million children, most of them in rural areas, were illiterate, and a shortage of teachers meant they had little chance of going to school. The war caused $2,125,000 worth of damage to the educational infrastructure, according to a government report.

Backed by officials from the education ministry (MINED), parents in some of the poorest villages decided to act, and in 1991 the EDUCO Community-Based Education Programme programme was launched. Local self-management of schools was a new concept for Latin America.

Parent-directors control the purse strings

EDUCO enabled parents to take part in running schools, from hiring teachers to paying their salaries. The parents—farmers and manual labourers—soon began to draw up plans and to use the money transferred to them by the ministry to pay teachers and running costs.

At Los Izotes, a village 35 km north of the capital, San Salvador, 260 children gather each day in a small building surrounded by trees and painted blue and white, El Salvador's national colours. Their school has the same timetable, the same equipment and the same lessons as any other in the country. Unlike most Salvadorian schools, however, it is run by local people.

EDUCO was first tried out here and in five other villages in very poor and inaccessible areas before being extended to the rest of the country and becoming the centrepiece of the government's education strategy. The number of children attending such locally-run schools rose from 8,400 in 1991 to more than 237,000 in 1999, according to MINED.

Each of the schools is managed by a community education association (ACE), whose members are parents elected at a general assembly. This allows courses to be decentralized and the administration to be streamlined. According to MINED, 1,722 ACEs were operating nationwide in 1999, with more than 4,700 teachers.

At Los Izotes the school population has increased, especially since the children no longer had to make the long journey to attend school in the nearest city, Quezaltepeque. To meet the growing demand, the families asked the government to build new premises in the village. "MINED asked us to look for a building that could house a temporary school while the new one was going up on a plot donated by a local landowner," says Jorge Alberto Molina, president of the Los Izotes ACE.

Molina, a 34-year-old father of five boys, says that after several months' work, the new building was opened in May 1999 and that this year it is expected to receive 300 children, from infants to seventh grade. The children are visibly happy about having a school to go to. "We really want our new school, and it's near to where we live so we can help our parents at home or in the fields," says 11-year-old Victor Valencia, who is in sixth grade.

At the end of each month, the teachers, who are on yearly contracts, make out a bill and the directors of the ACE pay their salaries and send the staff's contributions to the national social security and pension authorities. As in any private firm, the parent-directors are allowed to make pay deductions if a teacher is absent without a good reason.

At the end of the year, the ACE directors assess the teachers' work and decide whether or not to renew their contracts. Teachers in the EDUCO programme earn 3,485 colons ($400) and if they work double shifts (morning and afternoon), they get $514.

Stirring interest in other countries

A 1997 MINED study, backed by the World Bank, found that although children attending these schools were socially and economically worse off than those at traditional schools, the rate of academic success in both kinds of schools was about the same. But some in the state-run education sector criticize the EDUCO schools. Jesus Rivera, secretary-general of the National Association of Salvadoran Teachers, which has 21,000 members, says the EDUCO programme "deprives teachers of many of their rights, including the right to form a trade union. And since

Education has an important role in creating and defining the values that will make Africa politically and culturally united, coherent and forward-looking. Only when the purpose of education has been clearly defined can Africa decide what type of education is suitable for development.

Fay Chung, former minister of education of Zimbabwe, member of the International Commission on Education for the Twenty-first Century

San Salvador-based journalist

El Salvador: basic indicators

Population:
5.9 million
GNP per capita:
US$1,810
Literacy rate:
77 per cent
(female literacy rate:
74.2 per cent)
Net primary enrolment rate:
80.1 per cent

Source: UNDP

© Carlos Maria Marquez, San Salvador

Parents meet to discuss the running of the local school at Los Izotes, one of the first villages to take part in El Salvador's community-based education programme.

the contracts are renewed on a yearly basis, the teachers have no job security at all."

Despite the criticism, the World Bank praised EDUCO in 1997 as a "flagship programme." In the almost 10 years it has been going, EDUCO has also stirred interest in other countries. Missions have come from Brazil, Mexico, Guatemala, Honduras, Costa Rica, Panama, Uganda, Senegal and a dozen other countries to have a look at El Salvador's experiment.

The 1997 study noted that EDUCO "has been remarkably successful in expanding educational opportunities for the poor in rural areas." Santiago Miranda, a member of the Los Izotes ACE, emphatically agrees and says: "EDUCO has brought us development and given us the means to carry out other projects, such as building a road. Before that, no vehicles could get here. We also dug a well to provide water for the school. Then we got electricity and now we've even got phones in our village." ■

Mongolia: distance is no object

Michael Kohn with additional reporting by Altangerelyn Delgermaa

Camel-borne tutors range the steppe to back up a nationwide radio learning scheme which packages human rights awareness as well as job skills

Two years ago, life's opportunities were few and far between for Undermaa. At the age of 20, jobless and virtually destitute, she was caring for her newborn baby after her husband had left for the army. Her days were spent tending livestock beside her *ger* (white felt tent) on the outskirts of Darkhan in northern Mongolia. The country was in the depths of an economic depression. The last thing on her mind was politics.

Today Undermaa and her husband are living downtown, where she works for the Mongolian National Democratic Party. For the first time she has a steady income and a passion for politics.

In Undermaa's family, politics were taboo. Her grandfather had been branded an "enemy of the state" by the old Soviet-backed regime and exiled to the countryside in 1964 for supporting one of Mongolia's few dissidents. To bury this "crime", Undermaa's grandmother changed the family name and moved to a new city.

It wasn't until 1990, after the collapse of the old regime, that Undermaa learned of this dark past. But ▶

Respectively journalist with the *Mongol Messenger*, a weekly English-language newspaper based in Ulaanbaatar, and Mongolian freelance journalist

© S. Nowak, Germany

In between radio programmes students get down to their homework.

Mongolia: basic indicators

Population:
2.6 million
GNP per capita:
US$400
Literacy rate:
84 per cent
(female literacy rate: 78.6 per cent)

Source: World Bank and UNDP

the facts were not enough, she says. How could she analyse tyranny without the slightest notion of human rights? The missing "links" came from an unlikely source: a free sewing course advertised on the radio. Undermaa simply thought the course might help her get a job. But it came complete with a primer on human rights and good governance.

Undermaa's classes are part of a national distance education project, "Learning for Life", run by the Mongolian government and UNESCO with the financial assistance of the Danish aid agency, Danida. A total of 3,000 young students have tuned into weekly radio programmes on job-oriented topics ranging from basic marketing to computer skills and carpet-making. In between programmes, students follow exercises in textbooks and meet in groups every week or so for learning sessions with trained tutors. Special demonstrations are organized for hands-on training in the more technical skills.

While the focus is on helping students adjust to the country's economic transition to a more open economy, the project also aims to prepare them for more open government, which explains the section on human rights. At the same time, the aim is to reinforce the educational gains made under the previous communist state, notably with literacy rates in Russian Cyrillic script of about 85 per cent.

Distance education is not entirely new to Mongolia, one of the few countries where nomads make up 20 per cent of the population. During communism, state-run radio and television stations beamed educational programmes across the grassy steppes. But there was no need for a massive campaign, as virtually all children received schooling at county or provincial centres—even children of herding families living on the livestock co-operatives which dotted the vast Gobi Desert. Room and board were paid for by the state. Even universities were free for those who gained admission.

But those days are over. University education is no longer free, leaving those without means no other option than to forego higher education and join the workforce. Local NGOs are concerned that children are dropping out of school and living on the streets in cities like the capital, Ulaanbaatar. In the rural areas, many children stay at home to help their parents tend their herds of goats, yaks, camels and horses.

Against this backdrop, the coalition government elected in 1996 jumped at the chance of revitalizing the old concept of distance education with a new set of partners. At the top of the ladder, UNESCO provides the technical and conceptual experience to make the most of the funding provided by Danida ($1.7 million for five years).

Pooling resources

On the next rung, the education ministry is forging a new give-and-take relationship with other ministries. For example, part of the project money has gone to re-equipping the studios of national and regional public radio stations which are not just broadcasting programmes but helping to produce them. Journalists team up with education experts and businesspeople to produce shows on topics ranging from accountancy to starting a small restaurant. Private publishers have also got in on the act, and are producing new textbooks on sewing, hairdressing, photography and other skills that are a far cry from standard school subjects.

This pooling of resources includes the key actors, tutors, who supposedly volunteer but are often designated by local authorities. Most of them are schoolteachers but some are economists, accountants or other professionals, who take crash courses to assume their new role.

Initial results are encouraging. In an evaluation study involving 500 students in Ulaanbaatar, almost half had found jobs, while over 10 per cent had

Education is not a way of escaping the country's poverty. It is a way of fighting it.

Julius Nyerere (1922-1999)
former school teacher who became the first President of the United Republic of Tanzania

started their own businesses within six months of finishing the courses. About 20 students had enrolled in college. The rest were still looking for work.

But the real test lies in the "disadvantaged" countryside, where 90 per cent of the project participants live. Tutors, who make just $10-$20 for the entire course (4-6 months), meet 15 families each month. Travelling mostly by camel or on horseback, the tutor can cover distances of 80 kilometres to reach the families scattered across the steppes, which have virtually no roads, telephones and a monthly mail delivery at best. Given the harsh conditions, especially during the long frigid winter, the tutors cannot set a permanent teaching schedule and must make the most of their time with students. Most will liaise with one family member who teaches the others.

Ministry of Enlightenment (Science and Education) spokesman P. Tengis says the government sees no better option for rural people than long-distance education. "Ever since the livestock were privatized, families need all the help they can get," said Tengis. With few families willing or able to send their children to dormitory schools, Tengis explains that "kids from herders' families are spending their entire childhood out on the steppes.... So as long as we have our nomads, we will need distance learning."

The government says it plans to take over the project—and could one day offer accredited distance courses complete with exams and diplomas. But the same spokesperson also admits that this could be decades away—Mongolia's transition is far from over, leaving few resources for anything but the basics. ■

India: local heroes

Meenakshi Shedde

To tackle illiteracy, the Indian government made a U-turn by putting local communities and volunteers at the helm of the campaign

"You know, my daughter has graduated from university and now wants to study for a Master's degree," exclaims Sagar More as tears of pride well up in her eyes at the thought that her own daughter can dare to dream so big.

More, who is involved in India's National Literacy Mission as a volunteer with CORO (Committee of Resource Organizations), is a Dalit. As such, she belongs to the "Scheduled Castes"—the lowest castes in India. "As an 'untouchable', I had to sit one outstretched arm away from the upper caste girls in my class," she recalls. "I was constantly humiliated by the teacher, and dropped out after one year of school. But after becoming literate through CORO, I became a volunteer teacher with them."

When India's planners acknowledged that development could never really take off as long as the country was anchored down by illiteracy, a national literacy mission was initiated in 1988 to impart functional literacy to adults between 15 and 35 years. It ushered in a radical change of course by emphasizing initiative at the grassroots level.

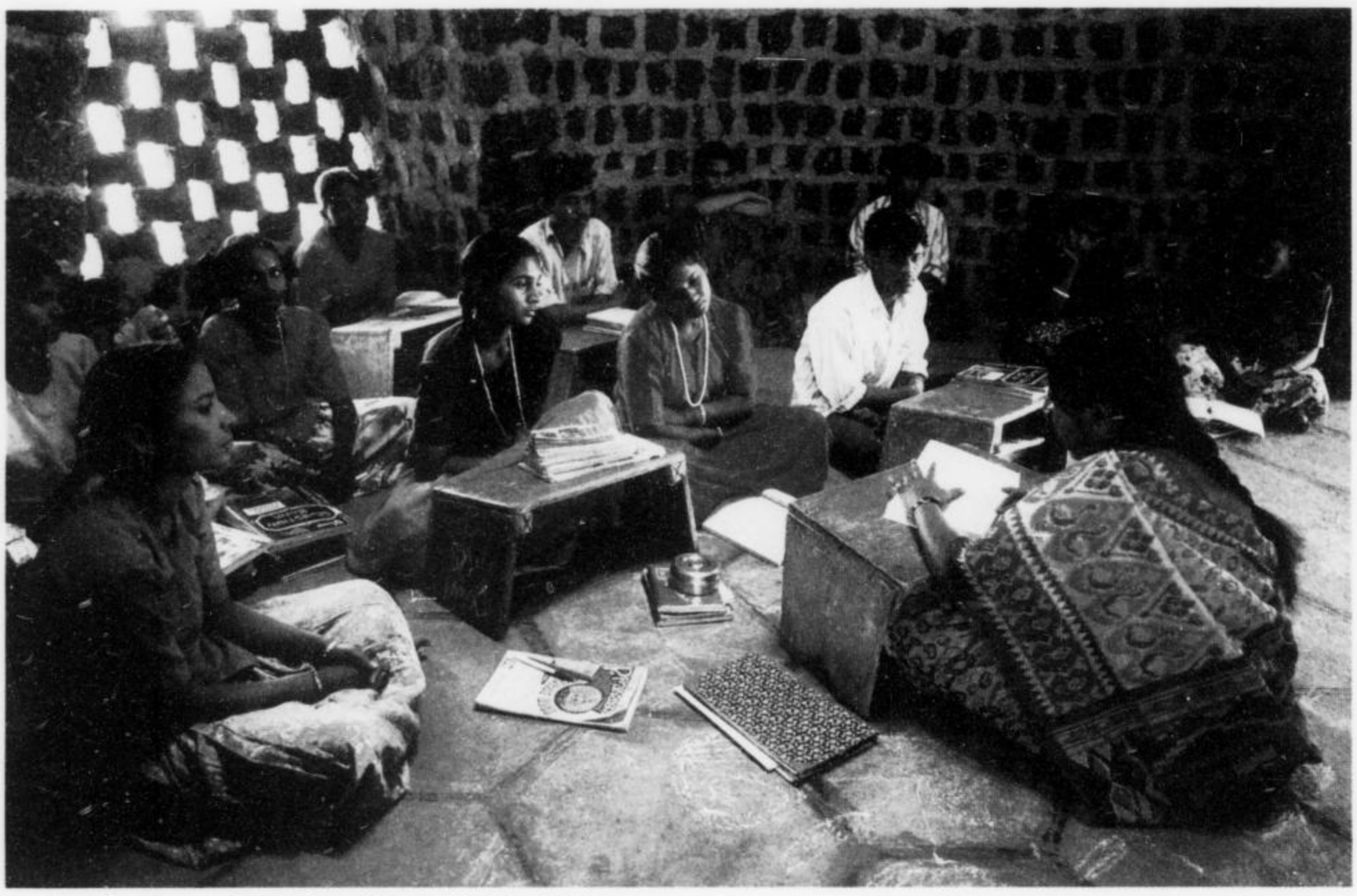
Driven by some ten million volunteers, the mission has recorded remarkable progress, especially in rural areas and amongst women. India's literacy rate, which was 18 per cent of the total population in 1951, rose from 52 per cent in 1991 to 62 per cent in 1999. If the present trend continues, India could attain a 75 per cent literacy rate by the year 2005, well ahead of 2011, as originally forecast.

"The national adult education programme was actually started by the government in 1978, with NGOs assigned barely 10 per cent of the funds," explains Murlindhar Gode, former chairman of the Maharashtra State Literacy Commission. "However, it was never perceived as a people's programme, and suffered from embezzlement of funds and poor target achievement. In 1988 the system was turned on its head. An autonomous National Literacy Mission Authority was established, to which the central government directly sanctioned funds, by-passing the state governments. District literacy committees were put at the centre of the programme, receiving 100 per cent of the funds. This brought it success at the grassroots level."

These committees are autonomous bodies which report directly to the National Literacy Mission. Education experts and NGOs are strongly represented on them alongside local officials. They conduct door-to-door surveys to identify non-literates, organize mobilization activities, select organizations and volunteers to participate in the campaign, and develop locally-relevant learning materials while keeping the larger national canvas and its concerns in view.

"We realized that in order to succeed, literacy had to become a grassroots social movement, and that is why we put volunteers at the heart of our strategy," explains Mr D. R. Parihar, Maharashtra's deputy secretary of school education. The campaign is driven by over 10 million unpaid volunteers nationwide—teachers and students from schools, colleges and universities, public sector employees, housewives, ex-servicemen, retired government officials and NGO members. Every state has a specialized resource centre which conducts a two-day training programme for volunteers and provides them with literacy materials. "The primers are simple with lots of drawings, written in the local Marathi language, and about very practical things like purchasing vegetables or ▸

Assistant editor of *The Times of India*



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A school for the rural poor in India's Andhra Pradesh state.

It is the supreme art of the teacher to awaken joy in creative expression and knowledge.

Albert Einstein, German-born U.S. physicist and mathematician (1879-1955)

bringing up children," explains P.Wankhede, an adult education officer in Maharashtra state.

In the Bombay area, CORO was founded when NGOs active in women's rights and youth movements and amongst trade unions realized to what extent illiteracy was impeding their work. "We have never seen literacy as an end, only a means," says Sujata Khandekar, CORO's chief secretary. Khandekar is actually an engineer with the state electricity board. Because of her interest in literacy issues and the campaign's national dimension, she was authorized to work for CORO while continuing to receive pay from her employer. "Literates must be able to use literacy to enrich their lives—to learn to demand, to question, to have a commitment to changing their situation. Mere familiarity with alphabets and counting numbers up to 100 is of no use. Therefore, we also have programmes for neo-literates relating to savings, legal literacy, social rights, alcoholism and atrocities against women."

Through community functions involving popular film stars, plays and television serials, volunteer teachers are mobilized. "Most of our teaching volunteers are between 15 and 30. They've followed about seven years of schooling. We prefer to choose them from the same community as the learners," Khandekar points out. "We cover an area of 1 million people in Bombay—of which 70 per cent live in the slums, including Dharavi, one of the biggest in Asia."

One indicator of CORO's success can be gauged, not from asking students like Sagar More to count up to 100 or sign her name, but from her assertiveness and confident smile. She has been transformed from an illiterate woman who was too timid to speak up even when spoken to into a zealous motivator, a treasurer of the women's Federation Credit Society and a librarian in charge of a mobile library. Although Sagar abandoned her formal studies after one year, she and her husband, also a Dalit, have ensured that all their four children have passed the 10th grade.

"I feel so gratified when our learners tackle local civic problems and take social responsibility for others. I've worked for CORO for five years without being paid, but now they give me a salary of 1,500 rupees ($36) a month," says More. "Sometimes they can't pay even that, but Ambedkar's idea of educating others through *shramdan* (donating labour) means much more to me." More is referring to Dr Babasaheb Ambedkar, a Dalit from Maharashtra state who rose to become the architect of India's constitution. Throughout his career, he emphasized education and women's rights and is considered a pioneering social reformer.

Motivation among the Dalits is especially high. "I found I was more effective when I made education an emotional issue," says Vilas Sarmalkar, another volunteer teacher. "The Dalits really revere Dr Ambedkar. Once, when I was dealing with a family that was reluctant to come to the class, I asked if I could then take down the portrait of him that they hung in their house. No, no, they said, horrified, and made sure they came from the next class on."

While volunteer teachers show unquestionable commitment to their work, their enthusiasm could wane in the long run in the absence of monetary benefits for them. "Of course, education through volunteers makes for financial savings. But the truth is that even if you have the money, it cannot buy you community participation," says Parihar. As CORO's Khandekar sums it up, an important means of sustaining volunteers' momentum is by applauding their efforts in the larger community. "Right now, they are only local heroes," she says. "But in fact, they should be everybody's heroes." ■

India: basic indicators

Population:
979.7 million (1998)
GNP per capita:
US$430
Literacy rate:
62 per cent
(female literacy rate: 50 per cent)
Net primary school enrolment ratio:
60.3 per cent

Source: World Bank and the Government of India

2| Uneven progress

World literacy: what went wrong?

Mohamed Maamouri

Ten years ago the world community pledged to halve the world illiteracy rate by the year 2000. It failed to meet the target. How can it get back on track?

The unfortunate and sobering news at the end of the second millennium is that the number of illiterate people in many developing countries still represents more than half their youth and adult populations, with girls and women comprising two-thirds of this number. Although regional illiteracy rates have been declining in the last decades, there are still close to 900 million illiterates in developing countries, representing nearly 25 per cent of the world's youth and adults. A troubling question must be asked: Why haven't we eradicated illiteracy or fulfilled the promises made at the Education For All Conference held in Jomtien, Thailand, in 1990 (see box page 18)?

All too often, "basic education" has been taken to mean formal primary schooling, and governments in developing countries and international donor agencies have followed this policy perspective, putting the vast majority of educational funding into improving access to primary schooling. But in spite of major investments in primary schooling the results are far from satisfactory.

Budgetary belt-tightening due to economic restructuring, falling per-capita spending on basic education, high demographic growth rates, and wars and endogenous conflicts have taken a heavy toll on formal educational systems in many developing countries of sub-Saharan Africa and South Asia, leading to a serious decline in the quality of school-based instruction and children's education. One consequence of this decline has been an increase in illiteracy and low literacy rates among out-of-school youth and young adults. In poor countries, especially those with significant population growth, the literacy situation may have become worse rather than better over the past decade.

It is almost universally true that, in spite of political rhetoric, literacy work has remained at the bottom of the budgetary ladder for both national agencies and multilateral donors. However, budgetary limitations alone cannot explain why it has proved so difficult to make inroads on illiteracy in poor developing countries. A review of past policies and practices indicates that a number of problems have been endemic.

Firstly, mass literacy campaigns presented literacy as a panacea for a variety of social ills and a passport to social and economic development. They were often more political than pedagogical, and made empty and unfulfilled claims that eventually led to the systematic downgrading and dismantling of literacy education.

Secondly, literacy work has been hampered by a general lack of motivation among teachers and learners, partly because definitions of literacy have been variable and poorly understood, teaching materials have been lacking, and career development possibilities for teachers have been non-existent. Literacy classes have not been perceived as having something immediate, relevant and direct to offer that would offset the opportunity costs of participation.

Thirdly, in many developing countries, reading and writing in adult literacy classes are often taught in indigenous languages, whereas formal primary schooling has used the official or cosmopolitan language (often that of the former colonial power). These conflicting language policies have established a barrier between the formal and non-formal systems of education, created problems for learners and their access to socio-economic opportunities. They often sow confusion and lower learner and teacher motivation.

Literacy statistics and the outcomes of literacy programmes are questionable. They are often measured only in terms of the numbers of those who have participated in the programmes. The emphasis on learning achievement made at the Jomtien ▸

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conference has not been a major part of literacy work over the past decade, though some encouraging trends are now being seen.

In many developing countries facing severe fiscal crises, the flexibility, diversity, and low-cost framework of non-formal education offer substantial opportunities, especially since basic skills are tools enabling the poor to enter economies undergoing major and rapid changes. Because market economy principles require more decentralization and more cost-sharing in education, governments in developing countries are turning to innovative partnerships and collaboration with NGOs. Their aim is to launch literacy and non-formal education programmes that can teach more basic learning skills in less time and at less cost than conventional schooling.

However more attention must be given to teacher training and ways of assessing results that go beyond the simple question of "can you read"? New assessment methodologies and low-cost multimedia teacher training tools are now being developed by the International Literacy Institute and UNESCO.

The growing "feminization" of poverty and its persistent burden on the status of women in the developing world are now recognized as critical areas of concern for literacy work, and several current literacy programmes are focusing on learning skills and strategies aimed at redressing the gender imbalance. These programmes offer a variety of practical solutions for the empowerment of needy women and are built around income-generating activities and productive employment, credit management skills, good parenting and child-rearing practices.

Many curriculum development innovations in literacy programmes involve the use of gender-sensitive materials in nutrition, primary health, home economics and HIV-Aids education. Linkage between adult learning and the education of youth and children has also emerged as a promising approach. The successes of several literacy programmes such as the community-based intergenerational programmes in Ghana or Egypt and the Tostan Project in Senegal* provide evidence that more progress is likely in this domain.

These emerging trends show that real progress can be achieved in the coming decade. Though literacy has moved nearer to the top of the agenda in many developing countries, it still needs to be given a more important place in the development plans of governments, national partners, NGOs, the private sector, and international agencies, along with greater investment and co-operation. ■

* This programme and other projects are described on ILI's website: www/literacyonline.org
"Breaking Through", Tostan's non-formal basic education programme in national languages in Senegal. Education for All, Innovations Series, no. 6.

Partnerships in practice

Mark Bray

Partnership will simply be a fashionable buzzword unless it is founded on mutual interest and trust and focuses on clear objectives

Ten years ago, the architects of the Jomtien Declaration acknowledged that in many settings governments alone could not be expected to provide basic education for all. They stressed that new and revitalized partnerships at all levels were necessary—betweeen governments and non-governmental organizations, the private sector, local communities, religious groups and families.

The notion of partnership has a positive ring, suggesting that the state and its partners work together in harmony. The reality is much more complex. Partnerships require strong mutual interest, trust on both sides, and a clear understanding of roles and objectives. All too common are cases of what Jomtien's architects had warned against, namely false partnerships which, simply put, come down to "passing the buck". The most flagrant examples have occurred in countries where central governments have collapsed, rendering them unable to collect taxes. Whether it be in Chad, Somalia, Cambodia or Uganda until the early 1990s, communities realized that if they wanted schools, they would have to provide for themselves. Studies have shown that in several of these countries, households and communities have carried between 60 and 90 per cent of the costs of primary education, which has barred many children from attending school altogether.

Cost-sharing

In many government-sponsored schemes, community financing is seen as an alternative to direct taxation. However, it is not necessarily preferable. In progressive systems of taxation, the rich pay more than the poor, but in many systems of community financing, the poor bear a heavier burden than the rich. Communities may also be given only limited control in schemes sponsored

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Building a school at Bafoussan, in Cameroon.

Let us not forget that the cost of each jet fighter equals one million children in primary school.

Dr Mahbub ul Haq (1934-1998), economist, former editor of the Human Development Report

by donor agencies. In other cases, the state has been unwilling to relinquish control but has allowed NGOs to flourish and fill the gaps, enabling a parallel system of schooling to emerge. Pakistan is a case in point, with over 5,000 NGOs involved in education.

In some instances, the collapse of the state has led of necessity to new partnerships, most notably in the ex-Soviet Union which was formerly characterized by a highly centralized system. In Russia and Azerbaijan, for example, communities have moved in to maintain at least some of the previous high standards of education.

In such settings, the economic and political crisis softened the rigid attitudes of the past on both sides: governments became more interested in the idea that communities could share some of the financial burden of schooling, and communities showed willingness to contribute resources. What started with a rather narrow focus on finance in many cases broadened to include planning, curriculum and other dimensions.

A dialogue between school and community

The point is instructive: genuine partnerships involve much more than mere contribution of finance. They are not a simple mechanism to secure resources and to reduce budgetary crises. Nor are they necessarily part of decentralization initiatives. In some settings, coordination and more rather than less centralization are needed.

The goal of partnerships should be clearly kept in mind: to improve pupils' attendance, retention and the quality of learning. School boards on which parents, teachers, local officials and other community representatives have a voice are one of the most effective tools for giving communities a greater say in the planning, running and monitoring of education.

Some countries do not have school boards; but in others the model has passed the test of time. For the past thirty years, Papua New Guinea has promoted in law and in practice the participation of parents and communities on primary school boards of management. Communities even have the power to decide on the languages of instruction despite the fact that the government meets the major costs of elementary education. Community members commonly join forces with teachers and others to encourage children's attendance and punctuality.

Targets cannot all be reached overnight, of course. Parents need to learn about broader policy issues, and the teachers need to find out more about their pupils' homes. In some countries, resources invested in school-level and community-level workshops have greatly improved the efficiency and effectiveness of education systems. They have facilitated dialogue between the school and the community.

The role of teachers on school boards should not be underestimated: they tend to hold different attitudes from central authorities regarding critical issues such as student drop-out, a major problem in the developing world. Many teachers see drop-out (or push-out) as a way of reducing class size and dealing with troublesome students rather than a problem. Discussion of these issues during workshops can change perspectives and attitudes, and can make the school a friendlier place in which to learn.

Governments have a major role to play in monitoring and guiding partnerships with communities: checks and balances are needed to ensure that school boards are not autocratic, that certain groups of students are not being discriminated against on the basis of race, ▶

► religion, ethnicity or gender, and that curriculum standards are met. The challenge is to strike a balance that safeguards the rights of children while not stifling local initiative.

One final word of warning: community partnerships almost inevitably involve resource contributions of some nature, in the form of fees and/or other levies. Opposition to fees has deep roots in various international declarations, and debate on the issue tends to be polarized. Education is of course never free: somebody has to pay. Significantly, the 1990 Jomtien Declaration observed that fee-free education provided by government alone is often of an insufficient quality to benefit the individual child, the community or the country.

The World Bank, in a 1999 policy report, went further, stating that "in principle, fees and other contributions paid by non-poor beneficiaries could free up public resources for targeting to the poor." Rather than flatly condemning fees, we would do better to sensitize school boards to the needs of the poor, and find every mechanism possible to protect them. In this endeavour, once again, the state has a pivotal role to play in promoting genuine partnerships with communities that serve, first and foremost, the child. ■

*A study by Mark Bray on community partnerships prepared for the Dakar conference (April 2000) will shortly be available on UNESCO's website: http://unesco.org/education/efa

Aid: an unfair deal?

◗ Kenneth King

A new donor discourse suggests that partnerships up to present have not been symmetrical. But new approaches seem equally flawed

At the end of some 40 years of development co-operation it may seem heart-warming that "partnership" is currently one of the key words in the development dictionary, or at least in its Northern edition. It is by no means as clear that it is as salient a term in the Southern editions. And this holds particularly true in the education and training sector.

It is good to hear so many donors talking of the need for partnerships with the South to be genuine and respectful, a tacit admission that to date many were not at all symmetrical. Yet even now, it is still the donors who are laying down the criteria for genuine partnership. Several of them are swapping some of their old partners for new ones who appear to comply with new requirements on governance, pro-poor growth, gender equity and basic education.

With some of these partners, the donors are trying out a new form of aid delivery known as the Sector Wide Approach or SWAP. However, despite their title, SWAPs are often not sector-wide, but turn out to be co-ordinated donor support to a single sub-sector, primary education. And it sometimes seems that the sheer scale and complexity of SWAPs means that they can be more invasive of the national sovereignty of a state than previous donor projects ever were.

This suggests a paradox at the heart of the SWAP partnership approach. The SWAP assumes that the government is in the driving seat—to use the donors' commonest metaphor—and has developed its own sector-wide policy framework and medium-term expenditure plan. It is then meant to co-ordinate the financial inputs of perhaps as many as 18 donors (as for example in the current SWAP to education in one African country) and be able to make its own judgments about its technical assistance needs. This is a tall order. And, arguably, countries that actually have this kind of capacity at national and provincial levels don't need this huge amount of co-ordinated donor funding. While those which still do desperately need external assistance don't have the capacity to be partners on these demanding terms.

A second kind of emerging partnership encompasses a series of new alliances that are no longer solely dependent on aid. They involve all kinds of twinning—of schools, of universities and colleges, and of educational and cultural resources such as museums. But in what kind of countries and institutions do we find these new twinning partners? Not surprisingly it is in the richer countries of the South, and in Asia rather than in some of the very poor institutions of sub-Saharan Africa, that such alliances are being cemented.

It is also in these richer countries, including part of South Africa, that there is increasingly a powerful business dimension to the new partnership discourse. In these kinds of environments, North-South partnerships turn out to be centrally concerned with selling Northern expertise, systems, frameworks, degrees and franchises—to "partners" whose key characteristic is capacity to pay.

Thus, despite the president of the World Bank's admission in December 1999 that development co-operation needs to be fundamentally rebuilt, it is a pity that some of the principal designs for this new architecture of partnership appear to have been already completed and the new buildings commissioned. In the North. ■

◗ Director, Centre of African Studies and professor of International and Comparative Education at the University of Edinburgh (Scotland). Editor of *NORRAG NEWS*, an aid policy bulletin. Its December 1999 issue focuses on partnerships.

Do schools foment inequality?

Fernando Reimers[1] argues that unless bold innovations are made, the education gap between rich and poor is bound to widen

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In Uzbekistan, a mother gives her son a helping hand with his homework.

The role of education in reducing poverty has often been stressed. How exactly do education and poverty relate?

There are several reasons why education can help reduce poverty. One of them is that the cognitive and social skills and credentials which can be gained in school expand the choices available to people and therefore their freedom. They increase the probability that people will become more productive, get better paid jobs, and adopt practices that lead to better health and having fewer children. But the impact of education on improving the living conditions of the poor and its impact on reducing social inequality are two different things. In some Latin American countries, for example, the wage gap between college graduates and those who do not have a college education has widened during the last decade.

How does this change our way of thinking about education?

Making sure the poor have the basic skills that will enable them to be productive is not enough to reduce inequalities in a context where the non-poor are also investing all they can in education. As a result of the big effort in expanding access to education that took place in many developing countries in the 1950s and 1960s, there has been plenty of intergenerational educational mobility. In Mexico, for example, 40 per cent of children in their sixth year of school have exceeded the educational level of their parents. That's a terrific achievement of the education system. But at the same time, the parents of the wealthiest 10 per cent are investing significantly more in the education of their children, who are reaching levels far beyond their own. The distance between these kids and those of the poor may even be widening. So we have a narrowing gap in terms of average years of schooling but a widening gap in terms of the quality of education received by different socio-economic groups and exclusion from access to the education levels that matter for social mobility (upper secondary and tertiary).

You argue that education systems often reinforce this gap.

Let's examine the origins of these educational equity gaps. One is that if every parent spends the same proportion of their resources on educating their child, richer parents will spend more in absolute terms. At a time when more and more private resources are likely to be invested in education, this is particularly problematic. Secondly, while progressive educators would say that it's the state's job to try to close the gap between rich and poor by directing tax revenue towards those who need it most, what we're seeing in many education systems is the reverse. More is spent on urban children and on universities, and less on groups with a weak political voice. A third source of inequality is that performance is determined not just by what teachers do or by resources in the school but also by resources in the home—by having a parent read to you at night, help you with homework and take an interest in your education. A fourth source stems from the fact that all too often teachers treat low-income children as deficient, disrespect them and their parents, and as a result teach them in ways that lead to school failure rather than success.

Do we know what kind of compensatory policies work best?

Here we have to look seriously at the content of what's being taught. A lot of the effort at expansion that took place in the 1960s and 1970s assumed that if we just gave more of the same to everybody, that would be enough. That is a questionable assumption. Some children are barely grasping a small part of the curriculum and the little they do learn will not help them get good jobs.

In the 21st century it's probably not going to be enough just to be able to read, write and add numbers. ▶

[1] Associate Professor at the Harvard Graduate School of Education, where he is director of a new Masters programme on International Education Policy, with a specific focus on equality of educational opportunity (http://gseweb.harvard.edu/apsp/iep.html). His latest book, *Unequal School Unequal Chances, The challenges to equal opportunity in the Americas* will be be published in August 2000 by Harvard University Press and the David Rockefeller Center for Latin American Studies.

► People will need skills to help them solve their problems, develop the capacity to learn throughout life, communicate and work in teams. We also have to realize that traditional education systems in developing countries lack the resources and capacity to provide all kids with education, especially at the levels that matter for social mobility.

The next education divide will not be measured by whether or not children complete primary education but by their access to and completion of secondary education. But the traditional model of secondary and tertiary education is expensive, with its separate subject matter specialists teaching separate grades, and some would argue that on efficiency grounds you cannot bring it to small rural communities. This is tantamount to excluding most of the poor. We should be thinking about alternative approaches such as multigrade secondary schools and distance education. Telecommunications technologies make it possible today to think in radically different ways about how to organize educational dialogue.

Where's the best place to start designing pro-poor educational policies?

The home, by designing curricula that tap resources existing among disadvantaged children. The assumption should be that low-income kids are not deficient in any way and that an education should be designed for them that is relevant to their talents and can involve their parents. But all too often, unfortunately, we don't know enough about these children to design relevant curricula for them. It is rare that education systems, policymakers and teachers demonstrate sufficient respect for the excluded to ask them what they want to know and organize educational encounters in ways that fit their particular demands and circumstances.

Are these innovations difficult to bring about?

They are problematic because you are asking the most vulnerable part of the education system, the one that deals with peripheral groups, to do more. What's more, not all education systems have the same capacity for innovation. Institutional capacities, resource bases and cultural and historical determinants differ from place to place. But I'm convinced that insisting on a single model of education is an impossible aspiration.

What about resources?

Political priorities are involved here. Some governments might say that they don't have the resources to innovate. But how much are they spending on defence? How much are they spending on bailing out private banks that have gone bankrupt and in many cases fuelled corruption and capital flight out of the country? In the long term, the solution is to deepen democratic processes so that the least empowered have more power and more voice. In the meantime inequalities are widening. The non-poor have to realize that it's in their interest to pay attention to the educational chances of the poor. Until and unless that happens, I think we are going to see reforms that are episodic and unsustainable in the long term. It's very important to reach a consensus in each society on the role educational equity will have as a common aspiration, a balance of interests. The demand for a more equitable distribution of educational opportunities has to come from both the poor and the non-poor. This is one of the main differences that you observe between the most and the least equitable nations: it's a certain ideology, a culture of how acceptable it is to have these kinds of disparities. There are ways, through social marketing campaigns for example, in which governments can educate and sensitize the population at large about certain priorities.

One of the lasting contributions educators can make to improve equality of opportunity is to engage their students and the public, both poor and non-poor, in conversations about these kinds of issues, about the value of aspiring to equal education outcomes and about the avenues to achieve it. ■

Interview by Cynthia Guttman

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● Unesco's World Education Report 2000, forthcoming in April, focuses on "The right to education: towards education for all throughout life." Available from Unesco Publishing:
Fax: +33 1 45 68 57 37 or + 33 1 45 68 57 41;
e-mail: publishing.promotion@unesco.org

● Ahead of the Dakar conference (see page 18), features, news updates, a discussion forum and country reports produced as part of the EFA 2000 Assessment can be found on Unesco's education for all website at: www.unesco.education.org/efa

Thematic studies will also be put online in the months to come. Information on innovative projects aimed at marginalized youth can be found on: www.unesco.org/education/exclusion/

● **Education International**, a valuable source of information on the status of teachers. www.ei-ie.org

● The **Association for the Development of Education in Africa (ADEA)** aims to develop partnerships between Ministers of Education and funding agencies. www.adeanet.org

● **ActionAid** is one of several NGOs involved in a global education campaign.
For more information, www.elimu.org

● Reports by **Oxfam**, "Education Now: Break the Cycle of Poverty" and "The IMF: Wrong diagnosis, wrong medicine" are available on the organization's site at www.oxfam.org

● The **Forum for African Women Educationists** (FAWE) is a pan-African organization seeking to raise awareness about the benefits of girls' education. Information from www. fawe.org

● **UNICEF's State of the World's Children 1999** is devoted to education. The 2000 report is also available at www.unicef.org

● **UNDP's Human Development Report 1999** gives a comprehensive understanding of the impact of globalization on human development, including education.

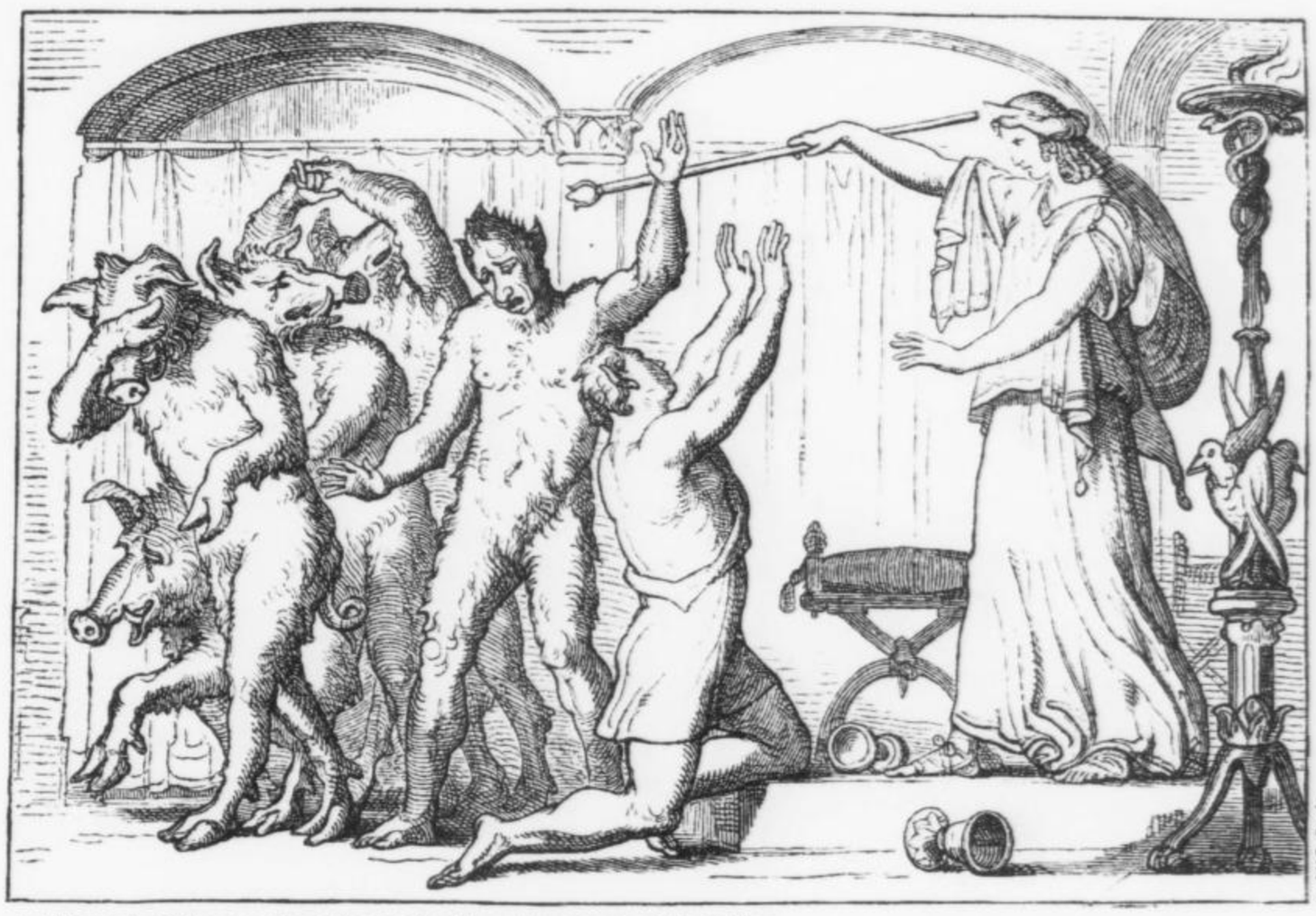
● **Learning: the Treasure Within**, Report to Unesco of the International Commission on Education for the Twenty-first Century, Unesco Publishing, 1998. ■

ANIMAL TRANSPLANTS: SAFE OR SORRY?

Amy Otchet

Animal organ transplantation into humans may save many lives or cause untold harm from diseases crossing the species barrier. How should society decide whether or not to go ahead?

Just over 15 years ago, Baby Fae became a household name when American doctors replaced her ailing heart with the heart of a baboon. From Australia to Brazil, millions were riveted by the news reports and followed her progress with baited breath. If they were half-expecting a Frankenstein's monster, they were disappointed. Baby Fae looked like any other wee newborn child. But the sci-fi lullaby turned grim 20 days after the transplant. On November 15, 1984 Baby Fae died. Later her mother angrily maintained that she hadn't been informed about the possible dangers involved. Unbeknownst to the doctors at the time, however, the stakes concerned far more than a single infant's life. We now know there is a possibility that the transplantation of animal organs into humans might unleash infectious diseases similar to Aids.



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In Homer's *Odyssey*, Circe the enchantress turns men into swine.

The scientific community is only beginning to understand the possible risks of xenotransplantation—the use of animal organs and tissue in "spare-part" surgery for humans. Over the past century, there have been about 25 documented cases of such organ transplants, the most recent case being reported in 1993. Kidneys, hearts and livers from baboons and monkeys were the organs of choice. Survival rates were dismal—most patients died within weeks. Today, however, thanks to progress in biotechnology and drug treatments, there is renewed interest in opening another round of human experiments. Scientists in the United States have already begun implanting pig cells to treat patients with Parkinson's disease and diabetes. Others await the green light to begin transplanting organs from pigs into people.

This growing interest is matched by rising fear, however, that an animal virus could jump from the pig to the human patient, spread to others and unleash a pandemic. When viruses cross the species barrier, the results can be catastrophic. At least one strain of HIV is believed to have jumped from monkeys to people after a single infectious event 60 years ago. The influenza epidemic of 1918-19, which killed tens of millions, may have been triggered by a pig infecting one person.

Xenotransplantation thus confronts the whole of society—not just individual patients—with the promise of saving thousands of lives and the possible risk of causing tremendous harm. The lack of scientific data transforms the safety issues into an ethical dilemma which scientists alone cannot answer.

Human transplantation has been a victim of its own success. Surgeons can now transplant about 25 different kinds of human organs and tissue, and survival rates are constantly improving (60 per cent of patients live more than five years). More than one million people worldwide have benefited since 1954, when the first transplant was made. But supply cannot meet demand. In the United States, for example, 3,900 people died while waiting for an organ transplant in 1996, compared to around 1,500 in 1988.

There are also strong economic arguments in favour of xenotransplantation. About 700,000 patients suffering from kidney disease world-wide are strapped to dialysis machines at an annual cost of about $19 billion, according to the Organization for Economic Co-operation and Development (OECD). It costs about 60 per cent less to transplant a kidney than to keep the patient on life-long dialysis. Success in xenotransplantation could open up an international market worth $6 billion plus another $5 billion in related drug treatments (to prevent the immune system from rejecting the organs). One of the biggest contenders is the pharmaceutical giant Novartis—which not only produced cyclosporin A, the leading drug used in human transplants, but also owns Imutran, a UK-based biotech company famous for genetically engineering pigs for xenotransplantation. ▶

UNESCO Courier journalist

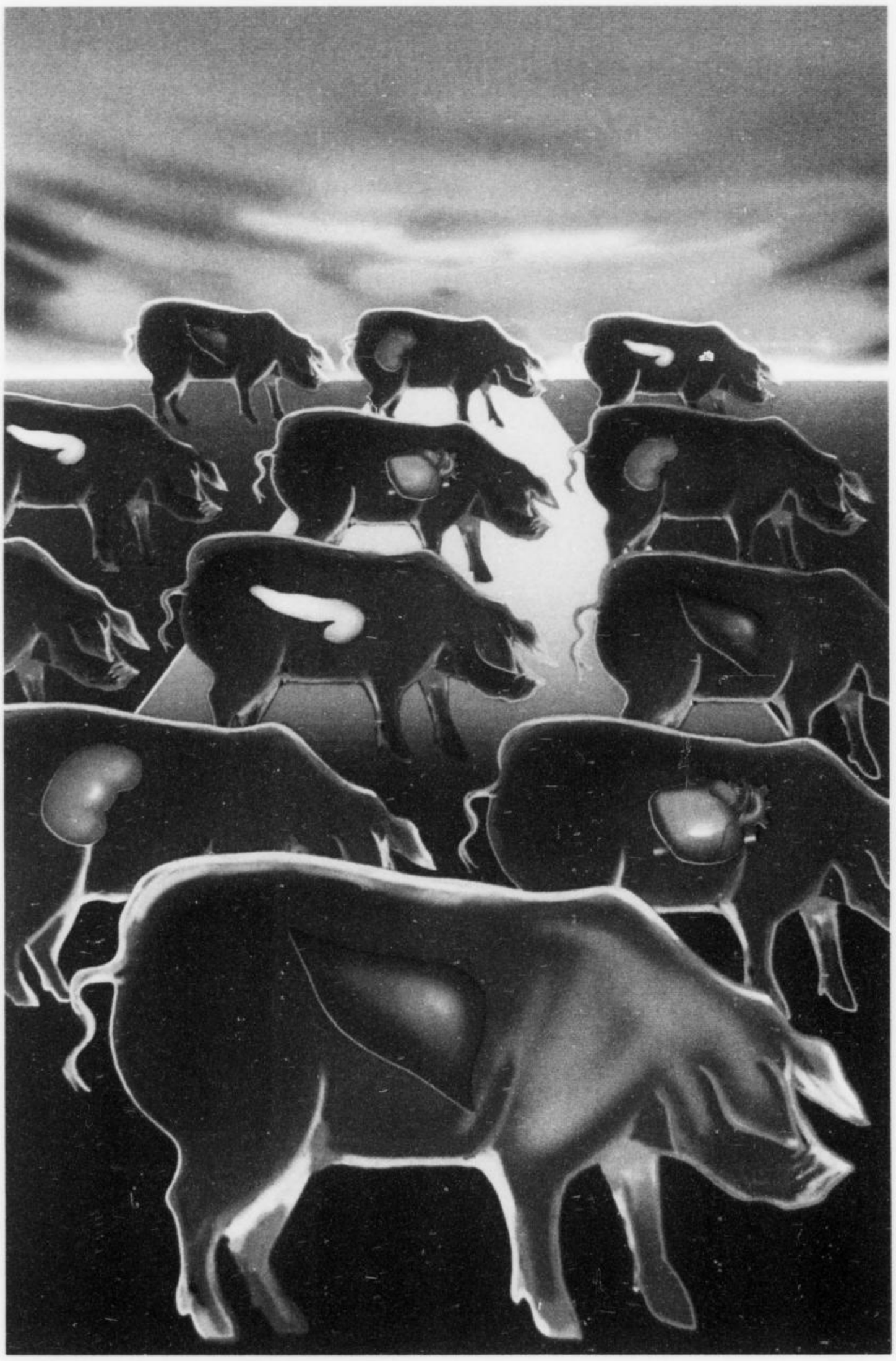
► Pigs are the xeno-prize-winners. Non-human primates, like baboons, have been ruled out because their biological similarities to human beings could increase the risk of disease transmission, so brutally highlighted by the Aids and Ebola viruses. Many people also have ethical qualms about using our "cousins" for spare parts, whereas we have been slaughtering and eating pigs for many centuries. Finally, pigs are easier to breed and genetically engineer.

Duping the human immune system

The human body would normally consider a pig organ to be a dangerous "foreign agent" and kill it within minutes by cutting off its blood supply. Imutran and other laboratories are trying to get past this defence (immune) system by lining the pigs' organs with human proteins through genetic engineering. These proteins endow the pig organ with a kind of human disguise. After a time, however, the human body would gradually realize that the pig organ isn't acceptable and would launch an attack on it. Imutran is now trying to develop new drugs and may add more human genes to the pigs, says Dr Corinne Savill, the company's chief operating officer.

These "designer pigs" may, however, make it easier for the animals' germs to infect people, says Dr Robin Weiss of University College London. About two years ago, Weiss began publishing articles showing how pig viruses could hide behind the human proteins (added to the pigs) and slip past a patient's immune system. The human proteins might also invite the viruses into human cells. For example, one of the human proteins used by Imutran and other biotech companies is CD55. This protein makes the human body vulnerable to several polio-related viruses. Suppose, says Weiss, that pigs have similar viruses. Ordinarily, they wouldn't affect humans because of genetic differences. But imagine that the pig viruses learn (through genetic modification) to use CD55 and infect the patient who receives the pig organ. Once a pig disease has crossed over into a single human being, it could mutate further and spread to others.

None of these questions would matter if the pigs could be issued with a "clean bill of health", says Weiss. Imutran, for example, is trying to breed germ-free pigs in tightly controlled facilities. But even in a hermetically sealed tank all the risks would not be eliminated, particularly those arising from viruses known as PERV retroviruses which are found in the animal's genes. Weiss has focused on three strains of PERV, which have been described as "second cousins" to HIV or human immunodeficiency virus which causes Aids. Two of them can infect human cells.



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Should humans harvest spare parts from animals?

Weiss's findings sent shockwaves through public health organizations and the industry. Researchers immediately set out to survey as many patients as they could find who had been exposed to porcine tissue. Out of about 175 patients screened, none were infected by PERV.

"It's a relief," says Weiss, but it's not conclusive. "This particular virus is not going to be highly contagious but this doesn't necessarily mean that xenotransplantation is safe." The patients in question received porcine tissue not organs, whose sheer volume may increase the risk of infection. Second, they were screened for the three known retroviruses. What about unknown germs? Weiss also wonders whether the retroviruses might be hiding somewhere in the body and become more powerful over time.

François Meslin of the World Health Organization describes a worst-case scenario: a xeno-patient harbours an undetected virus which is passed to others by sexual intercourse, a likely means of transmission. As the virus moves from one host to another, it becomes increasingly dangerous.

"You can take a lot of precautions but you never know how far to go to bring the risks down to an acceptable level," says

Meslin, who points to the case of bovine spongiform encephalopathy—"mad cow disease"—as the closest example of this kind of dilemma. Since Weiss sounded the alert, public health authorities around the world have observed a de facto moratorium on human experiments with xenotransplantation, which doctors describe as clinical trials. This doesn't mean that they are giving up on the research, however. What is happening is that most Western governments are setting up special advisory or regulatory bodies to review any future clinical trials and prepare strict guidelines for monitoring them.

The U.S. and Britain, who are the leaders in xeno-research, are currently finalizing guidelines to monitor not just the patients, but their family-members and health-workers. While the authorities refuse to release the details, it has been said that xeno-patients should refrain from having children, marrying or even travelling internationally. This sounds like a replay of discussions concerning people infected with HIV, says Prof Bartha Maria Knoppers, a Canadian bioethicist regularly called on by OECD to examine the ethics of xeno-research. Close monitoring of patients should not mean trampling on their human rights, Knoppers believes. "Besides," she says, "are we really going to be able to enforce these conditions?" Would it be possible, for example, to take legal steps to prevent a patient from deciding to have a child two years after a clinical trial?

Assessing the risk of viral infections

The sponsors of these trials—mostly biotech companies—will also come under the microscope. Ordinarily, proposals to test new medical procedures or treatments on humans are considered commercial secrets which are restricted to the company involved and the relevant governmental regulatory body, e.g. the U.S. Food and Drug Administration (FDA) which is responsible for approving tests on humans for new medical drugs or procedures. This is not so with xenotransplantation, however. In the United States, a special advisory committee composed of some 15 scientific experts will openly review all requests to test animal organs in people before the FDA renders a decision.

"Absence of evidence is not absence of risk," says Phil Noguchi, director of the FDA's division of cellular and gene therapies. For example, two years ago bio-tech companies proudly insisted that their pigs were germ-free. But when news of the PERV retroviruses came out, Noguchi says, the companies suddenly "worked a lot harder" to examine the risks. Noguchi also maintains that viral infections are difficult to evaluate. "They may not happen often enough to be a publishable event," he says. "But in a clinical experiment one tenth of a sixth of a chance of infection is a whole lot." This is why the FDA is counting on help from the advisory committee to look in all the "nooks and crannies" where a virus might hide. "We're still in a very difficult position because to a large extent we rely on industry to provide the proof that a clinical experiment is safe," Noguchi notes. "But we also depend on our own scientists."

For Noguchi, the advisory body also scores extra points by offering a "public forum" to discuss the ethical issues—from animal welfare concerns to deciding who should receive an animal organ. First, companies might focus on patients with the greatest chances of surviving instead of those most in need of a transplant. Second, it will take years—if ever—before pig organs are effective. For a patient on the verge of death a pig organ could buy a few extra weeks until a human organ becomes available. Should such patients receive priority on the waiting list? There is a third major concern, says John Davies of the U.S. National Kidney Foundation, the world's largest non-profit charity for kidney patients. "We don't want people to stop donating the organs of their loved ones [for human transplants] after the first animal transplant trials," says Davies, "because they think the problem has been resolved." While Davies supports xeno-research, he is not convinced that it will prove successful.

The problem is that discussions take place between people with vested interests of one kind or another. They fail to include the largest group affected, the public.

The problem is that these discussions take place between people with vested interests of one kind or another. They fail to include the largest group affected, the public. "It can be argued that there should be some sort of 'community consent'," says Dr A.S. Daar of Oman, who chaired the World Health Organization's consultation on xenotransplantation. "Is the FDA mandate to protect the public enough of a proxy for community consent?" asks Daar. "Until the public is informed about the issues and is discussing them, I don't think you would want to go ahead with clinical trials."

Daar is looking for ways of stimulating public debate and consent by working with an international committee of "concerned" citizens—mostly scientists and bioethicists brought together by the prestigious Hastings Center, a bioethics think-tank in New York. The aim is to help countries to develop national but non-governmental committees of individuals from various walks of life—economics, law, religion, the media, etc.—who will take time to become informed about xenotransplantation but don't themselves have any vested interests in the matter. These committees would hold "consensus conferences"—what Americans call "townhall meetings"—to spread information about xenotransplantation and gauge the public's response to it.

This idea is the brainchild of Fritz Bach, a scientist at Harvard Medical School who first called for a legal moratorium on clinical trials in the U.S. Bach is often portrayed as a virulent opponent of xenotransplantation and yet he is a leading scientist in the field as well as a paid consultant for Novartis. His corporate sponsor isn't thrilled by his idea of townhall meetings. "You cannot go forward by publicly discussing such complicated subjects," says Imutran/Novartis's Dr Savill. "Now, whether governments have set up the right agencies is another question. Like anything else in society, are the right people in the right place making the decisions? And does the public have confidence in them?"

Bach isn't convinced. "Some insiders think this [moratorium and public consultation] would be a good thing for Novartis," he says. "Just look at the tremendous hullabaloo over genetically modified organisms. If a blue ribbon committee—without any connections to Monsanto—had informed the public that they thought the [GM] food was safe on the shelves, we wouldn't have had this reaction. The scariest thing is always the unknown." ■

● To find out more or to express your views on ethical and policy issues related to xenotransplantation, contact the electronic discussion group set up by the World Health Organization and Health Canada:
www.oecd.org/dsti/sti/s_t/biotech/xenosite/country.htm

COMPUTERS REBUILD THE PAST

Sophie Boukhari

Three-dimensional imaging is increasingly used to recapture the appearance of ancient sites and legendary figures. But not everybody is happy about seeing the past through 3-D spectacles

"Come back from the land of the dead!" is the startling exhortation made at the beginning of a new television film about Ramses II using digitally-engineered images. The film, not yet complete, brings history's best-known pharaoh back to life from among his fellow mummies.

In one sequence, Ramses is puzzled when he finds that his temple of Abu Simbel no longer stands on the site where he built it. It was moved by UNESCO in the 1960s to save it from flooding caused by construction of the Aswan Dam. But he goes inside it when asked to do so by the god Amon. Today, the images engraved on the inner walls of the temple have lost their original colouring, but they appear in the film in all their former splendour. Thanks to French archaeologist Cécile Breton, their brilliant colours have been digitally restored.

"I worked from traces of colouring left on the walls," she says. "Egyptian art was highly codified. We know a certain god's crown should be red and his hat should be blue, and that Isis's robe is either red or green. In the latter case we solve the problem by looking at other temples where the colours haven't disappeared and choosing the more likely colour."

Portraits in the round

The film, which is scheduled to be shown in September 2000, continues with an account by Michel Evenot, an official of the Paris Court of Appeal who for years compiled identikit portraits for legal use. Evenot, who died in July 1999, was pleased to be involved in the first attempt to make a three-dimensional reconstitution from a mummy.

"We were used to producing full-face and profile pictures," he says, which in two dimensions (2-D), cannot be 100 per cent compatible. Further research had to be done so that the two images were perfectly consistent. In 3-D, no "cheating" is possible. There is no room for approximations in digital models constructed from real data.

The Ramses II film, which is expected to cost around $1.5 million, is a spectacular example of the extraordinary potential of new imaging technology for presenting the world's cultural and monumental heritage.

"Archaeologists spend their time dealing with uncertainty and think that when you don't know something, you have to leave dotted lines in the drawings. But 3-D images force you to come down off the fence."

Initially developed for use in industry, digitization and animation techniques can be used to recreate the appearance of famous historical figures and sites that have crumbled away or disappeared beneath the waves. They also make for more effective restoration of fragile or badly damaged artworks and provide useful tools for archaeologists and curators of museums and sites.

"These technologies can be used in two ways with heritage," says Benoît Coignard, a French "info-sculptor". "You can reconstitute and preserve the shape of something and use it scientifically in various ways, and you can recreate a world and an environment for people to marvel at."

Experimentation in 3-D imaging has proliferated since the late 1980s. Many places, from Egyptian heritage sites to ancient Indian villages in Ohio, prehistoric grottoes and jewels of Antiquity, have been made into 3-D models for use in films, on the Internet or on interactive CD-Roms. The user can move around freely, whether just taking a casual look or carefully scrutinizing the image from every angle. Specialists note that the technique is only in its infancy.

"There are still only a few centres where this kind of work is underway at a sophisticated level," says John Hancock, of the Center for the Electronic Reconstruction of Historical and Archaeological Sites, at the University of Cincinnati (U.S.). "Hardly anyone is pursuing the level of architectural and visual detail that is really required to bring ancient worlds to life."

The obstacles are financial as well as technical. Synthesis imaging, which has made tremendous progress in the past decade, still cannot produce total realism. Heritage experts and engineers also sometimes have trouble understanding each other and working together. The equipment is still very expensive, even though prices are steadily falling. A 3-D scanner costs more than $150,000, and making a computer model of a two-metre-high statue costs about $30,000. This is not counting the cost of research, which makes the bill even bigger. "If you want to work scientifically," says Breton, "it can take a week of research to pin down the exact position of a door or a detail of a piece of clothing."

University projects are funded by governments or philanthropists. Many firms have become involved as a way of testing their new technology and getting publicity for themselves. Television stations and museums also invest in producing educational or entertainment programmes and along the way pay for archaeological research. But overall, says Richard Lapointe of Quebec's Laval University, these technologies, underused because they are so expensive, are far from being generally available. "The world

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powers in heritage, archaeology and technology are Europe, North America, Japan and Australia," he says. In these rich parts of the world, the new imaging technologies are starting to be added to the archaeologist's toolkit. They make it possible to "document" objects without touching or spoiling them, says Philippe Martinez, an Egyptologist at the French National Centre for Scientific Research (CNRS).

In 1993, for example, a "virtual" archaeological investigation reconstituted the cargo scattered around an inaccessible wreck that has been lying in more than 660 metres of water since the first century AD. Three sets of photos were taken from a submarine that glided over the site. The pictures were then processed by a computer to make a digital 3-D model.

In Thailand, the ancient capital of the kingdom of Siam, Ayutthaya, has been "reassembled" on a CD-Rom from vestiges scattered around the modern city. The church of Cluny in France was once the biggest edifice of medieval Christianity. Little is left of it today, but its appearance has been reconstituted thanks to synthesized images.

Using 3-D scanners and digital cameras, archaeologists report they can build models from drawings with unprecedented accuracy. These models can help them to refine their interpretation of historical evidence. "Hypotheses can be investigated and tested in new ways," says Hancock.

"We won't be able to say what's true, but we'll be able to say what isn't true," says Martinez. "In 2-D, if part of the structure gets in the way, you pick a new angle where it doesn't show and you get round the problem. In 3-D, every part has to fit perfectly with the others."

Computerized simulation of archaeological hypotheses has often led to the disproval of theories and even to the acquisition of new knowledge. At a prehistoric site in the Ohio Valley, "the surrounding landscape context was restored to its original condition in order to test astronomical alignments," says Hancock. In Greece, advanced equipment belonging to France's state-owned utility Electricité de France and designed for testing nuclear power stations, produced a far clearer impression of the *tholos* (circular temple) at Delphi.

With the increasing threats to world heritage from wars, pollution, urban expansion and theft, back-up digital images of monuments and objects could be extremely useful. In Afghanistan, for example, where the statues of Buddha in the Bamyan Valley have been looted by the Taliban, Coignard says such imaging would have enabled the shape of these remarkable objects to be recorded so they could be reproduced in the future. But the cost of such work is currently so prohibitive that only a few projects are underway. One of them, the ECHO project run by the University of California at Berkeley (U.S.) and sponsored by a group of big companies, seeks to record the shape of about 100 endangered Egyptian monuments.

These virtual clones can be used in restoration work. Here, the German city of Dresden has played a pioneering role. After German reunification, the government decided to rebuild this "Florence on the Elba" which had been bombed by the Allies in the Second World War. The city began by ordering a computer model of one of Dresden's architectural jewels, the Church of Our Lady (the Frauenkirche), an 18th-century church which had been reduced to rubble.

"When I presented the synthesized images for the first time in 1993, there was an extraordinary silence," remembers Luc Génévriez, who made them. "People were weeping." The virtual reconstitution, which drew on a mass of historical documents and photographs, was used as a guide in the real-life reconstruction of the church, which should be complete in 2003. The computer model was also used in a televised appeal to Germans that raised money for the project.

The advantages of imaging in heritage restoration have also been seen in Alexandria, in Egypt. Coignard tells how he reconstituted the city's colossus in 1998 using huge blocks of stone fished out of the sea. "We carried out a virtual reconstruction by digitizing bits of the sculpture with a 3-D scanner, moving them around the screen to see if they fitted together and then simulating the reassembly of the whole statue."

Since the head of the statue weighs three tonnes, the arms several hundred kg and the entire colossus about 20 tonnes, not having to bother about weight was a great advantage. "The best thing," says Coignard, "was being able to test the equilibrium of the statue. With the colossus, whose fragments were very worn, we managed to come up with a stable structure and a base which fitted perfectly and in theory enabled the statue to resist even earthquakes."

The new virtual images have "enormous potential" for visitors to museums, says Cliff Ogleby, of Melbourne University, in Australia. More and more museums are installing multimedia facilities and commissioning interactive products which both educate and entertain visitors. They can also display and sell them on their websites.

The museum next to the site of the huge Roman amphitheatre at El Djem, in Tunisia, today echoes as of old to the sound of gladiatorial combat. In France, the inaccessible underwater prehistoric site of the Cosquer Grotto has been turned into a film of digital images which will be presented at the Marseilles Museum in April 2000. In many places, major exhibitions of world heritage are enriched by interactive features that help fund the museums where they are held.

Like television and the film industry, ▸

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© Luc Genevriez, Paris

Computer imaging recreates the face of pharaoh Ramses II (right) from his mummified body (left).

► "video games make wide use of 3-D modelling of heritage sites to flesh out their adventures," says Lapointe. "This is the information age and archaeology is being popularized wherever there's money to be made."

Some historians and archaeologists are uncomfortable with this mingling of different worlds. Génévriez recalls the fuss the scientific community made in the early 1990s when he was asked, as part of IBM's communication policy, to make synthesis images of the Cluny church and the Roman baths in Paris.

Beware of bogus images

"There were tremendous battles among the experts over the site, to the point where I had to work out my own ideas about it and finish the job by myself. The resulting film stirred up a dreadful row. I was accused of having distorted 'the truth' even though nobody knew what the truth was. Scientists are scared of pictures." Often, he says, new technology upsets them because it makes them question their practices and familiar ideas and forces them to make choices. "Archaeologists spend their time dealing with uncertainty and think that when you don't know something, you have to leave dotted lines in the drawings," says Breton. "But 3-D images force you to come down off the fence."

A lot of "bogus images" made from unreliable material are in circulation, says Martinez. Archaeologists also resent the fact that people make no distinction between images based on a massive amount of scientific work and images in video games." From this perspective, the dangers of the virtual world are real. The general public is presented with reconstitutions of ancient sites but has neither the means nor the desire to question their scientific quality now that technology can produce images almost as good as photographs.

But despite these reservations, more and more scientists, especially in the English-speaking countries, are moving into 3-D modelling. "Any means of representation involves conjectures, distortions and the possibility of misreadings," admits Hancock. But these drawbacks are outweighed, he believes, by the advantages of increasing public awareness of world heritage and the importance of protecting it. ■

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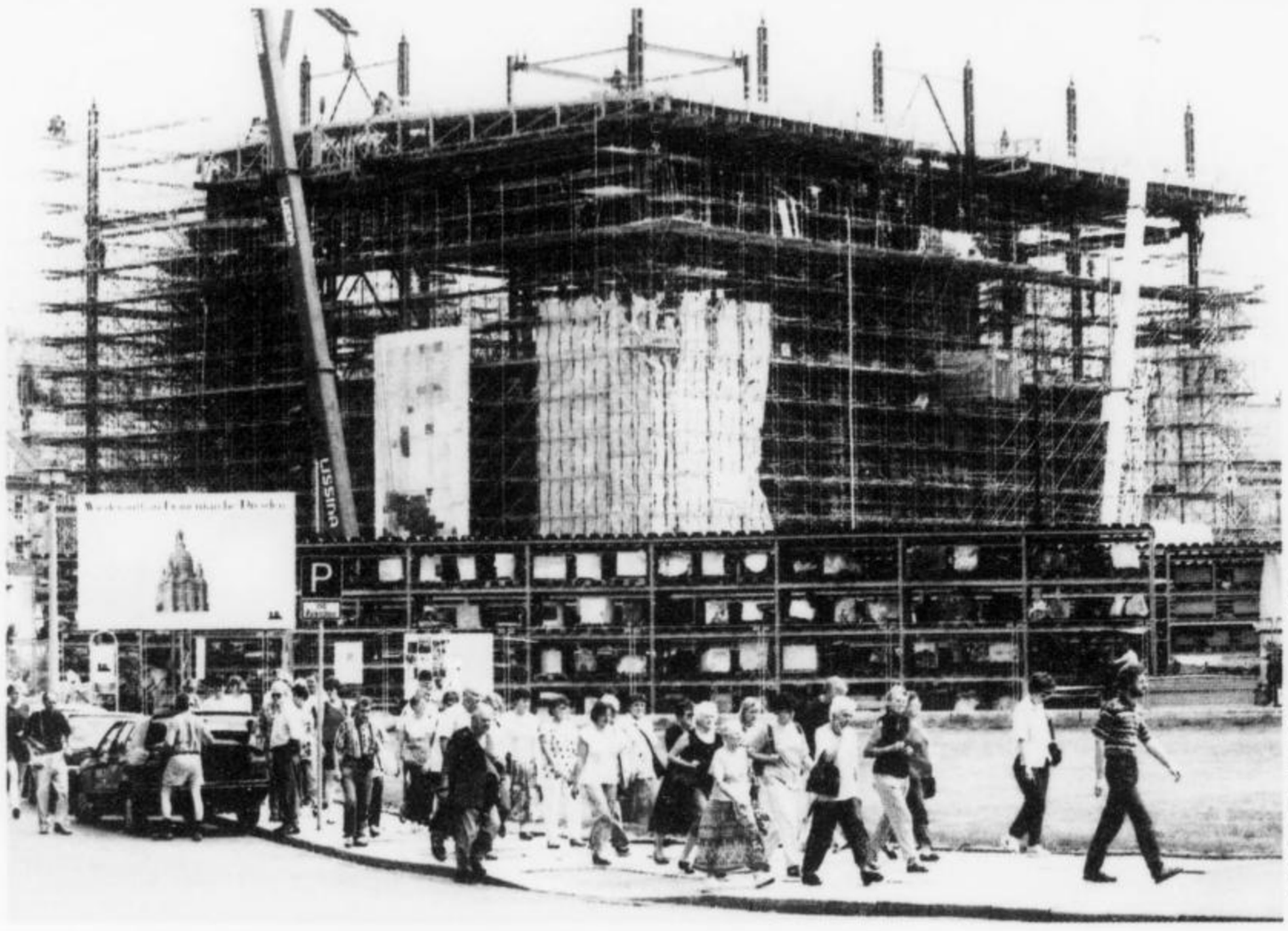

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© Luc Genevriez, Paris

In 1945, the church of Our Lady in Dresden (Germany) was reduced to rubble by bombing (top). The edifice is now being rebuilt (middle photo). To help the builders, the city authorities commissioned a virtual reconstruction of the monument (above).

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- **Website of the International Festival of Multimedia in Archaeology, Archeovirtua: perso.cybercable.fr/platypus/inscrit.html**

Other websites:

- **www.cdv.berkeley.edu/ECHO/**
- **www.learningsites.com**
- **www.cerhas.uc.edu**
- **www.sli.unimelb.edu.au**

TELECENTRES SHARE THE TOOLS OF THE INFORMATION AGE

Richard Fuchs

Telecentres offer a promising route for rural communities of the developing world to break out of their isolation

Christopher Senono used to travel by bicycle 16 kilometres each way to make a telephone call. A 30-year-old businessman from Nakaseke, Uganda, he managed his small lumber and brick retail trade by talking on the phone with suppliers in Kampala. The trip seemed natural in a country where the "teledensity" is roughly three phone lines per 1,000 inhabitants. Not any more! Life in this village 60 km from Kampala has changed since the opening of a multipurpose community telecentre (MCT) in 1999.

First launched in 1985 in the farming community of Velmdalen (Sweden), telecentres aim to introduce new information and communication technologies to isolated areas and provide people with the skills to benefit from them. After spreading throughout rural areas of the North, they are now cropping up in Africa, Latin America and Asia, often with support from international development agencies. It is likely that at least several hundred new centres are being started up each year. In countries where individual ownership of information and communications is out of most people's reach, these telecentres may become the primary way of allowing vast numbers to participate in the information economy, provided a few basic conditions are met.

The first step is often to demonstrate how the equipment and facilities available in a telecentre can be made to work for the communities where they are located. Second, time must be spent helping local farmers, teachers or entrepreneurs understand the value of information and the tools that can be used to access it. Thirdly, staff must have the training and skills to keep abreast of developments in software, hardware and networking technology. The most efficient way to do this is to ensure that they have a forum within which to meet, both virtually and humanly, so that links are created among them. Finally, once the telecentre is up and running, its staff must court the community at large and introduce its members to basic computer skills and identify ways in which they might benefit from the facilities and services.

Identifying and training local champions who will nurture a telecentre project can make or break the success of such a service. It is especially important to have local stakeholders from health clinics, municipalities, elementary schools and teacher training colleges looking over your shoulder. They are the people who are most likely to become the core users who will diffuse the technologies widely. In Uganda, a candidate in a local election in the Nakaseke district turned the telecentre into a local campaign issue, going as far as to promise people who supported him a free trip to visit a European or North American telecentre. Without necessarily going to these ends, generating community interest in the earliest stages of planning is a long-term asset. Often, in developing regions, communities are involved by providing rent-free facilities to accommodate a telecentre or by building new ones.

It takes between $50,000 and $75,000 to start a standard telecentre, although the early planning, organizing and mobilization work can significantly increase the price tag (the budgets of several current projects run from $450,000 to $850,000). Annual operating costs are much less and generally include two or three staff people. There are different paths to sustainability: telecentres sometimes become an integral part of a hospital service, a school or a municipality after three to five years. Alternatively, they can sustain themselves by offering such profitable services as telephone, fax, photocopying, résumé writing, training in desktop publishing and word-processing. And if they don't manage all of this, telecentres at least have the benefit of leaving behind a new corps of locally trained and skilled people.

As international development agencies increasingly come to recognize the correlation between the adoption of information and communications technologies (ICTs) and economic development, we need to understand that a social investment is required for the services available in a telecentre to take root and offer benefits in the developing world.

As international development agencies increasingly come to recognize the correlation between the adoption of information and communications technologies (ICTs) and economic development, we need to understand that a social investment is required for the services available in a telecentre to take root and offer benefits in the developing world. We should see telecentres as a social investment which can help build a future in the information economy that is interactive, not extractive. At the telecentre in Nakaseke and in many other communities in the developing world, there are increasing numbers of people who are committed to making sure this happens. ■

Sociologist, president of Future Works Inc, based in the Canadian rural community of Torbay, Newfoundland (www.futureworks.ca).
The author was involved in establishing North America's first rural telecentres and has assisted with telecentre startups in Africa and Indonesia.

TIMBUKTU ONLINE

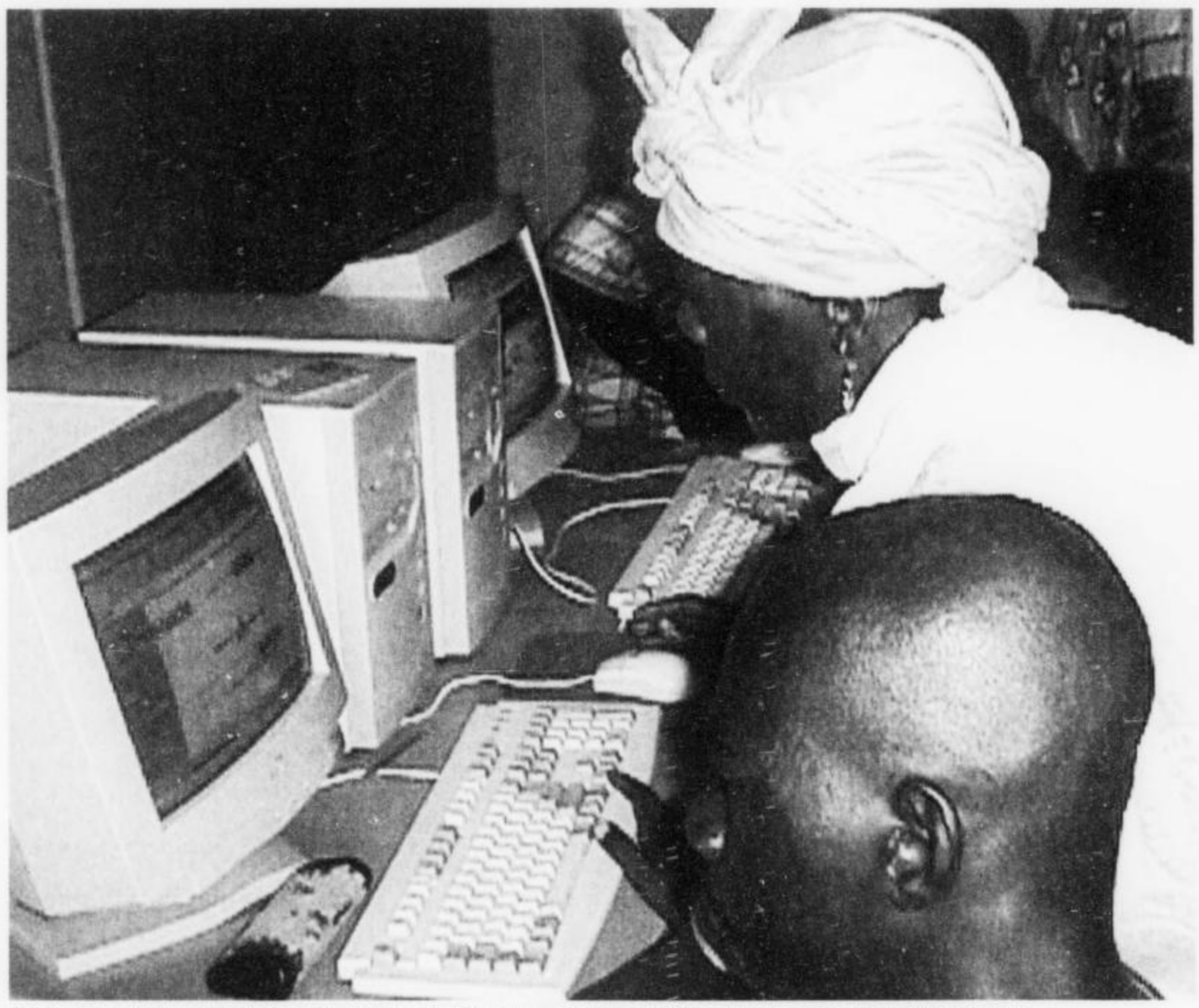
Sophie Boukhari

A historic city on the edge of the Sahara is banking on an Internet connection to revitalize its economic life

"Internet! Internet!" A street urchin rushes towards a journalist who has just arrived in Timbuktu (Mali). "Look what a French reporter gave me," he boasts in front of his chums, showing an e-mail address scrawled on a little notepad. "I'm going to the MCT[1] this afternoon to write to him."

Since its MCT (Multipurpose Community Telecentre) opened in May 1998, Timbuktu (30,000 inhabitants) has felt less of a prisoner of the Sahara desert. Along with traditional local hangouts, where the menfolk gather in the evenings to gossip, the MCT has become the trendiest place in town.

Men in traditional dress, women and inquisitive youngsters regularly crowd in the doorway of the temporary premises in an annex of the town hall. "They all come to look," says Birama Diallo, the centre's energetic coordinator, with a laugh.



© Telecentre of Timbuktu

Timbuktu's telecentre has attracted more than 2,000 visitors since it was opened in May 1998.

Electronic advice

Like most people in Timbuktu, the mayor, Ibrahim Mohamed, sees the MCT first as a source of the kind of knowledge needed to revive the region's stagnant social and economic life. The most encouraging MCT-based projects are being drawn up in the fields of medicine, teaching, the media, culture, agriculture and tourism.

"A group of doctors has been trained to look for information on the Web," says Canadian France Henri, a UNESCO consultant. "They've already found some terrific pages about gynaecological problems. They printed them out, photocopied them and handed them out at the hospital. They'd also like to be able to get 'electronic advice' from their colleagues in Bamako [Mali's capital] and elsewhere."

"The most urgent thing for us is to find out about other people's experiences," adds a teacher. "Some countries have the same problems as we do, for example, in getting girls enrolled in school.[2] We'd like to know what solutions they've found." He suggests material from the Internet could be used to produce some good school textbooks, which are few and far between.

The Net could also be useful to the four local radio stations, says Diallo. "For example, they could use it to find out how to make best use of the new varieties of floating rice that were recently introduced into the region and put that information out in their farming programmes."

The regional director for cultural affairs wants to commission the MCT to create some web pages about the history and heritage of Timbuktu. The tourist sector, still in its infancy, wants to do the same kind of thing to attract visitors. Through its website, not yet complete, the MCT presents an attractive view of "the town of 333 saints."

The townspeople do not want to be just consumers of ideas and pictures, says Diallo. "They're also very keen to make themselves known." He recalls that in the Middle Ages, "Holy Timbuktu" was a beacon throughout West Africa and the Islamic world. It had 180 madrasahs (Koranic schools) and the renowned Sankore University, which was attended by up to 25,000 students. The mosques and tens of thousands of ancient manuscripts, preserved by families and by the Ahmed Baba cultural centre, are evidence of this intense intellectual activity.

But beyond this material heritage, Timbuktu is banking on its intangible attraction as a place to escape from the world, on the aura of the unknown and the inaccessible that it conjures up in Western minds. "Our asset is our name," says Mayor Mohamed. "The word Timbuktu says something to everybody, even people who don't know where Mali is," adds Culture and Tourism Minister Aminata Traoré. "These days, people in the West have a great urge to get away

1. The French term, which is actually used in Timbuktu, is TCP = Télécentre Communautaire Polyvalent.

UNESCO Courier journalist

2 The proportion of girls attending school in Mali is very low (41 per cent) and particularly low in the Timbuktu area (23.7 per cent).

from it all. Timbuktu hasn't got much to sell, but it can sell dreams."

The way the MCT works is simple. To raise money for community development projects, it sells a range of services, such as telecommunications (public phones, fax, e-mail and Internet access), the production of databases and web pages, digitizing text and word-processing. It charges less than a dollar (U.S.) to send an e-mail and $2.50 to surf the Web for an hour.

The centre also runs courses, including an introduction to the Internet and new technologies, how to find information online, and library science. "Students and other people come to us because universities in Mali don't offer proper computer training," says Diallo. "If they want to get a job in Bamako, they have to know something about computers."

In a country with fewer than 2,000 people connected to the Internet among a population of more than 10 million, the MCT is the only "decentralized" server and the only one that is publicly owned. The five others are private and based in Bamako. For the moment, MCT's capacity only allows 20 subscribers (so far, 17 have signed up, at a monthly fee of $28).

"The quality of the phone line to the Internet connection node in Bamako is also poor," says Diallo. "If 30 people go online at the same time then the line is saturated," admits Zourkoufili Maïga, the regional director of the state telecommunications company, Sotelma. "And since the telephone arrived in rural areas in 1999, this has often happened."

© Telecentre of Timbuktu

Timbuktu's telecentre sells a range of telecommunications and word processing services.

Diallo is waiting impatiently for the arrival of a VSAT (Very Small Aperture Terminal), promised by the International Telecommunication Union, to improve the situation. The VSAT, a small satellite antenna, will mean the MCT will no longer need to use terrestrial phone lines.

The centre cost about $850,000 to set up, half of which was provided by international funding agencies.[3] It employs six people and has 11 computers, but will get several dozen more machines when it moves into permanent premises, which are near completion and being paid for by the townspeople. To raise the $50,000 start-up costs, the town authorities have staged a number of events, including a gala of the Timbuktu Residents and Friends Association and a cultural week, and also appealed to local people to contribute. In 1999, an airport tax for tourists was introduced, with all the proceeds going to help pay for the building work.

Despite technical problems, the MCT seems to have impressed the townspeople. "Since it opened, people have started buying computers," says Diallo. So far, about 2,000 have visited the centre, and members of professional organizations and NGOs, tourists, guides, librarians, secretaries, students and others have come looking for information or to buy one of the services on offer.

But the future is not yet secure. If the centre is to survive, it will have to be self-financing by 2001, when outside funding ends. Financial independence is especially important because the main national body behind the project, Sotelma, is being privatized.

"We can make it if we have 200 Internet subscribers," says Diallo. This is a lot for the northern region of the country, which has only 570 telephone subscribers (400 in Timbuktu and 170 in rural areas) and an illiteracy rate of over 80 per cent. But Diallo is counting on better quality service, especially when the VSAT arrives, to win customers outside the region.

From the Sahara to cyberspace

"The private Internet providers are complaining about unfair competition," he admits, "but what are they doing to develop their own services and to set up cybercafés outside the capital?" He says only a public service can take the first steps to allow people in the countryside access to cyberspace. It costs five to 10 times more to install a phone in a rural area than in a town.

"To safeguard the future of the MCT, it's not enough to ensure its commercial success," says Henri, the UNESCO consultant. "The money earned must keep on funding community development projects."

For these people on the sidelines of the global village, the centre is not just a fancy telecommunications shop. It gives hope of a new world. "The Internet isn't a luxury of the rich," says Mohamed. "On the contrary, it's really for the poor, who have very little access to information." On the edge of the Sahara, books are few and expensive, and half the population has never seen television. ■

3 Mainly the International Development Research Centre, the International Telecommunication Union, UNESCO, the UN Food and Agriculture Organization and the World Health Organization.

WEBSITE OF THE MONTH

http://www.worldwaterforum.org

The scarcity of freshwater is one of today's most pressing issues. The equation is alarming–20 per cent more water is needed than is available to feed the additional 3 billion people expected to be living on the earth by 2025! Addressing this problem is the World Water Forum which convenes in The Hague this month, the culmination of a two-year process bringing together thousands of specialists, decision-makers and concerned citizens. They will unveil a World Water Vision–specific actions to achieve a common set of goals ensuring everyone's access to clean water. The forum will serve as the launching pad for a new set of strategies and activities to create mass public awareness and generate political commitment with a view to making that vision a reality. ■

TALKING TO...

JOHN ABBOTT, SOUTH AFRICA'S CITY STITCHER

Squatter settlements are 'home' to around a billion people in and around Third World cities. The authorities usually want to bulldoze them. South African urban engineer John Abbott thinks they should be upgraded and woven into the urban fabric

Shantytowns, squatters' communities, slums–these are some of the names used to describe informal settlements. How many people in the world call them home?

Between 40 per cent and 50 per cent of the population in the cities of the South are living in these settlements—that's roughly one billion people. The rate at which the settlements are growing varies from region to region. In most of Latin America, the growth rate has peaked, but it's still increasing in Asia and sub-Saharan Africa. In my own city, Cape Town, informal settlements are growing at about 10 per cent per year—but you must remember that South Africa's starting point is relatively low. Informal settlements were rarely allowed to develop under apartheid.

What are the main characteristics of informal settlements?

First, the people don't generally have any legal tenure to the land they occupy. Second, the settlements lie outside the formal planning process. As a result, they usually lack or have very low levels of basic services like water and sanitation. And, of course, the dwellings are informal in the sense that they are built by the people themselves out of basic materials in a very simple manner.

Why are these settlements growing? Is it because formal housing projects are too expensive?

The problem encompasses financing and the availability of land. Land is a commodity available to the rich and the middle class but not to the poor. On the one hand, you have private landowners who want to get the highest return from their land—and dealing with very poor people is generally not perceived as bringing good financial returns. On the other, many cities still have a lot of public land. But city authorities in the South have neither resources nor strategy to cope with the number of people moving in from the countryside. These people are looking to improve their economic opportunities but they can't afford formal housing.

Doesn't the solution lie in building and subsidizing more public housing?

The public service is a bureaucracy which cannot cope with this type of problem. In every city, the authorities' first approach is the same: try building more formal housing to replace informal settlements. But they never succeed because they will only develop areas that conform to certain standards of infrastructure, planning and housing construction. Instead of considering the alternatives, these bureaucracies plod along, building too few houses too slowly—houses which are too expensive for the people they were intended for. These standards actually divert government from the real problem, which is assisting the urban poor. Look at what happened in Brazil. Despite all the good intentions, public housing was taken over by the middle class and never reached the poor.

If you want to go out and sell food informally at the market, who is going to look after your children? If you don't get paid on a regular basis, how do you live from month to month? If you get sick, who is going to help you?

Most city authorities find informal settlements in such deplorable states that they feel they must start from scratch, destroy the old shacks and rebuild new homes. Why are so you adamantly opposed to this?

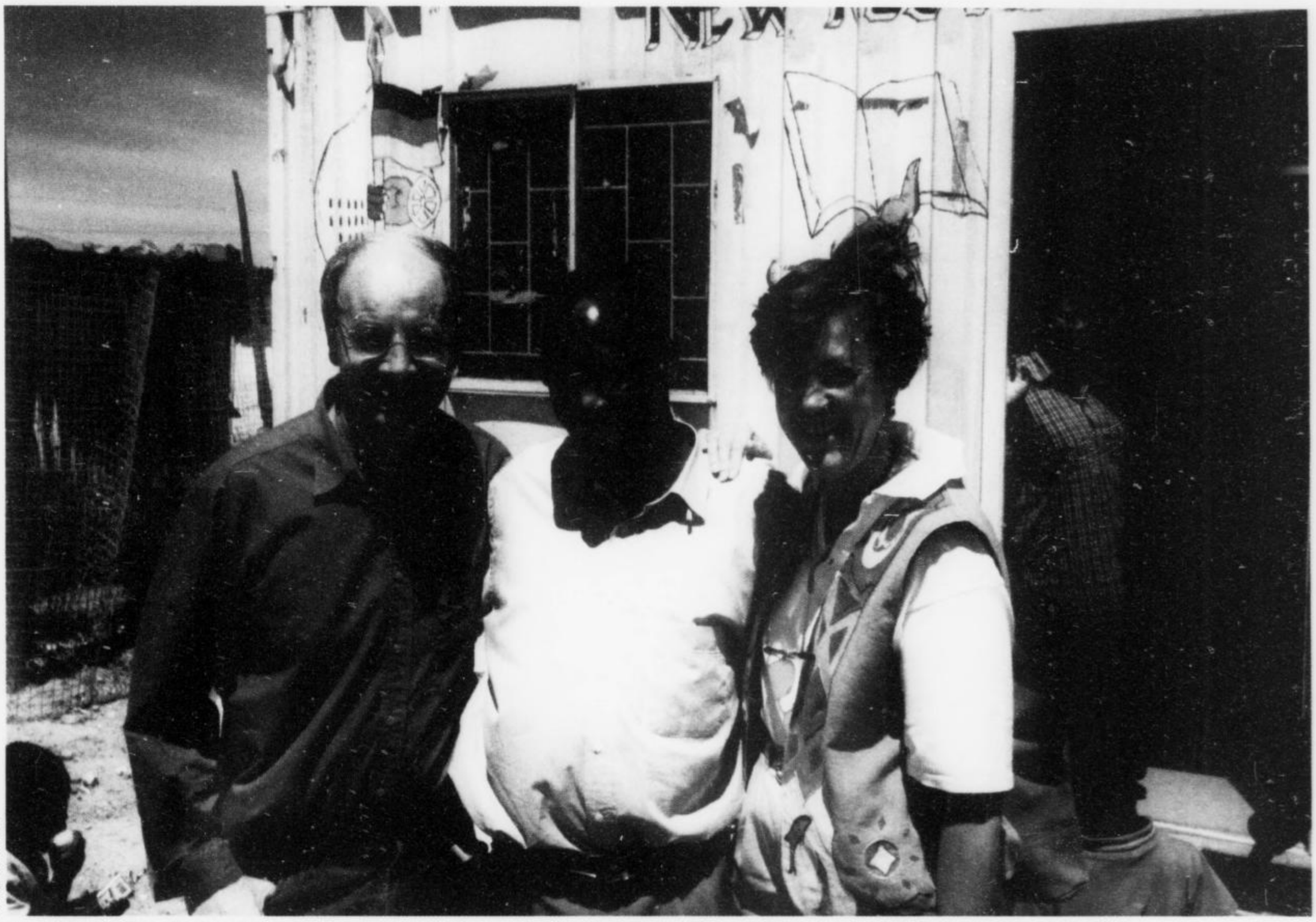
First, because it destroys a physical asset. You're not building new shelter; you're simply replacing existing shelter. So you aren't adding to the overall stock of housing. Instead of a financial benefit, there is a major financial loss. You're also creating an immense social cost by destroying all the social networks and mechanisms which people have built to survive in these informal settlements. Third, you never end up relodging every family. Some are bound to be uprooted and left with no place to go except another informal settlement. That's been proven over and over again.

But isn't it better to offer people a proper house than leave them in a slum?

Let's turn the question round. Is it better to house 10 per cent of the population and leave the rest in slum conditions or is it better to work with 100 per cent of the population so that they slowly improve their own condition?

You often refer to the social networks of informal settlements as "social capital". What do you mean by this?

It's something of a paradox. On the one hand, these settlements can be very dangerous places. In Rio de Janeiro, for example, it is felt that drug dealers use the informal settlements as a base because the police cannot access or monitor them easily. It is also true that people in informal settlements suffer more from serious crime than people in higher income areas. But this tends to draw them closer together. You cannot put a dollar figure on these social networks, but this social capital is extremely valuable. Survival is based on interdependence. You don't have the resources in an informal settlement to operate as an individual. If you want to go out and sell food informally at the market,



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John Abbott (left) and two colleagues engaged on a Cape Town project to upgrade an informal settlement (see also photos on pages 48 and 49).

who is going to look after your children? If you don't get paid on a regular basis, how do you live from month to month? If you get sick, who is going to help you?

But don't people take this capital from one settlement to another?

When an informal settlement is destroyed, people are generally moved in a random fashion. They lose the linkages that exist not just between individuals but between groups. Very often, people from certain rural areas move to particular informal settlements in the cities. So when they arrive, they have a lot of things in common. They operate collectively. When they get moved, they lose those communal ties. To make things worse, the local authorities in the new settlements treat families as individual units—e.g., by the design of the physical dwelling they live in and the taxes they pay. The whole framework of their life forces them to behave as individuals, not collective units.

You've described the major faults of the top-down approach cities usually take in dealing with informal settlements. What are the alternatives?

That depends to some extent on the culture and the income level of the city. There are two major approaches: the first is people-based and exists in countries like India, Sri Lanka and Pakistan where there is great poverty. The most famous example is the Orangi settlement in Karachi. There, the people decided that their first priority lay in building a sanitation system because the municipal authority wouldn't do anything about it. So they raised the money and the manpower to lay their own sewer pipes, with technical assistance from an NGO. The pipes ran from the shacks to open ditches on the outskirts of the settlements. This forced the local authority to connect their sanitation system to a treatment facility.

Very often, people from certain rural areas move to particular informal settlements in the cities. So when they arrive, they have a lot of things in common. They operate collectively. When they get moved, they lose those communal ties.

The second approach is found in Brazil where there is a more structured partnership between community organizations, professionals and NGOs. This kind of partnership makes it possible to look beyond immediate issues and develop a longer-term, wide-range vision for the community. Instead of focusing on one aspect like sanitation, you can also look at others such as housing and access to public transportation. You begin by developing plans as to where you want your settlement to be and how you want it to grow and develop. This generally requires external funding, especially for infrastructure. The two different approaches basically reflect the different levels of wealth in cities like Rio and Karachi.

How have you gone about things in Cape Town?

We have developed the Brazilian model and are working at a people-driven level to reinforce the economic base of informal settlements. But we want to do more than just improve the physical infrastructure of the settlements as dormitory suburbs—places ▶

AT HOME IN THE SLUMS

'I was born in a very poor area in England, which is probably why I feel very comfortable in informal settlements," says John Abbott. Co-ordinator of the University of Cape Town's urban management programme, he is an urban engineer who has won an international reputation for improving conditions in South Africa's informal settlements. "People come together because they need each other," he says, "especially in situations where 60 or 70 per cent of the population is very poor. I'm not saying it's only poverty [that creates this solidarity] but if you don't have individual transport, TV and all those luxuries that draw you more into your private world, you tend to rely on collective action or entertainment for a social life as well as for social need."

Abbott first landed in Africa at the age of 12 when his parents moved to Uganda and Kenya. He went back to England for his university studies, but soon returned to the continent, working in South Africa as a civil engineer before switching to urban engineering.

Increasingly aware of the brutalities of apartheid while living in Johannesburg and then Cape Town, in 1985 he started Planact, an NGO which brought together civic organizations and trade unions in the struggle for urban equality in South Africa and became famous throughout the country.

This struggle came to a head for Abbott in 1986, when he began working with an informal settlement near the coastal city of Port Elizabeth. Parts of the sprawling settlement "could be seen by white residents and there was a move to get rid of it," says Abbott. Instead of destroying the settlement, Abbott and Planact tried to upgrade it with the help of civic movements and with financial support from several big companies. But just as the upgrading plan was taking shape, the government decreed a state of emergency across the country, which provided "a blanket of secrecy for the army to move in and totally destroy the community," says Abbott. "Every family was bulldozed out. They moved to a temporary camp, but quite a lot of people died from malnourishment and disease."

Very few people knew about the destruction, he says, because the newspapers were banned from reporting on what was considered a "military secret". "It was one of the transforming events of my life," he says. From then on, he kept one foot in the academic world of urban management at the University of Cape Town, but, he says, "I shifted my work increasingly towards informal settlements." ■

► where people sleep but do not work. I don't think physical restructuring alone is going to promote economic development. You have to go to the roots of the problem. Our ultimate aim is to integrate these settlements into the fabric of the city.

At the University of Cape Town, we have a pilot project involving over 2,500 families or about 10,000 people. We began by using satellite images of the settlement to develop a computer-based map which offers everyone a clear vision of the settlement—each family can see its place in the community. We are starting to collect demographic and economic information about their households. For example, there turns out to be a fair number of people in the house-building trade. So we've introduced support schemes to build a corps of trained workers to upgrade the settlement.

We've also found that about 60 per cent of the people are in formal employment but about 20 per cent work in the informal sector and 20 per cent had no visible means of financial support. We highlighted all the informal businesses on the map and are trying to find ways of supporting them. For example, the community is now linked with a number of tour operators who are bringing overseas tourists into the area to spur business. We're also fund-raising overseas to construct a market to sustain tourism.

Are you suggesting that there's no point in upgrading a settlement without an overall development strategy?

That depends on the city. In cities in India, for example, it's hard to imagine a time on the horizon when you will have formal settlements because there are just so many people and so little space. In Cape Town, we still have the time to transform informal settlements into formal areas. In African cities in general, it is possible to combine long-term planning and vision with more immediate needs.

What does it mean to transform an informal settlement into a formal settlement?

There has to be some sort of land security. Land titles are the common but not the only form of tenure. The issues of access, social services and health care also have to be dealt with. Cape Town, for example, probably has the highest incidence of tuberculosis in the world because of flooding in winter. Informal settlements are particularly hard hit by water-borne diseases. The high infant mortality is also caused by living in dark, dank, confined spaces reeking of paraffin.

So far, we've talked about upgrading conditions for people already living in informal settlements. But how do you plan for and manage the flow of newcomers?

You *don't* begin by worrying about foolishly high standards for roads, large building plots and big open "public spaces". Instead you work on planning a basic minimum which can be developed very cheaply and quickly. Local authorities can begin by marking out building plots that use space as economically as possible. In Brazil, they opt for multi-storied buildings, but here in Africa people prefer single-story dwellings. You can still plan for a density of up to 100 dwellings per hectare. Large public open spaces aren't necessary at this point. Instead of high-quality roads, you design access

Computerized mapping technology is used to help plan an access road to the settlement.

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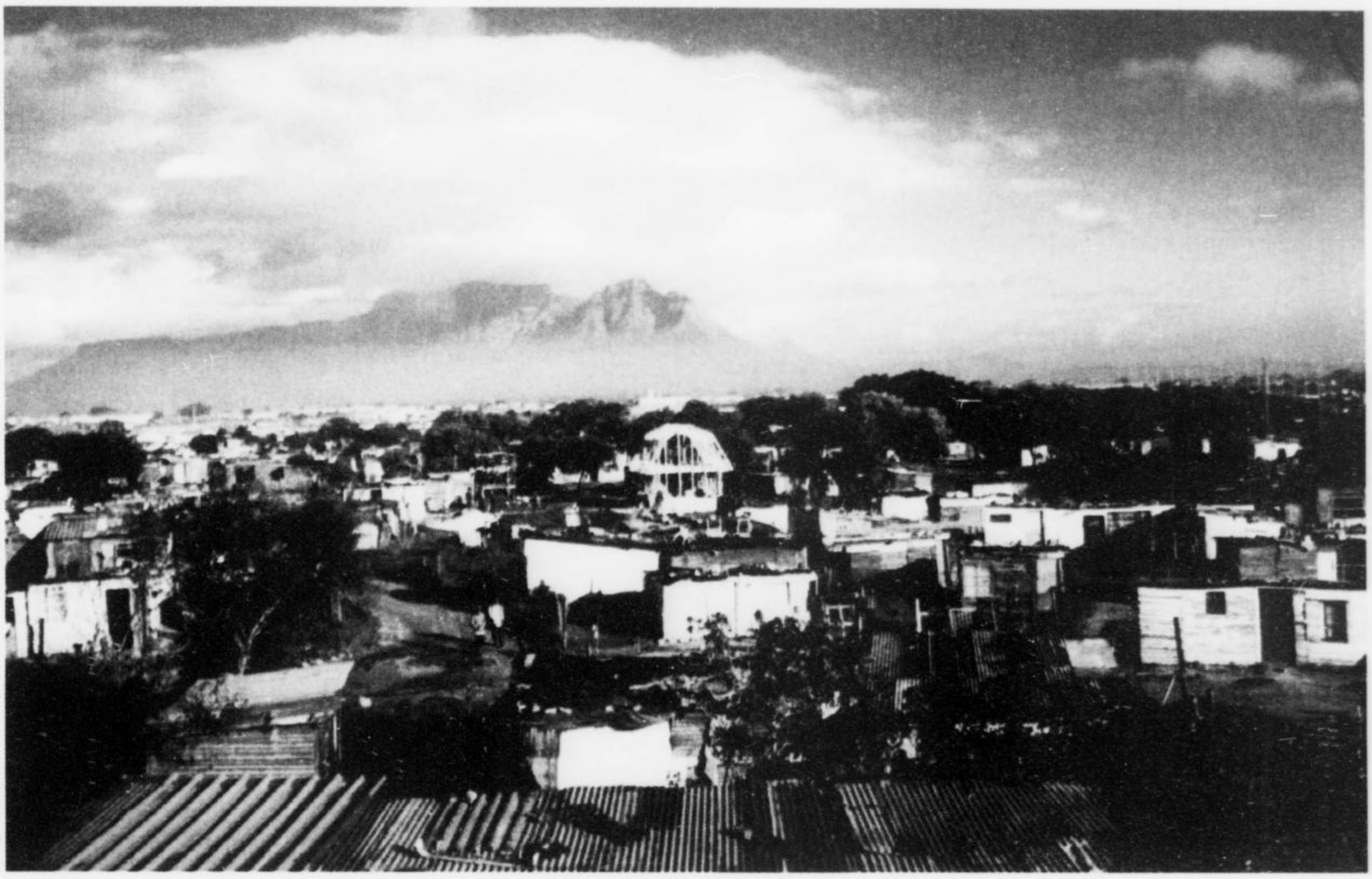

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Construction workers who live in the settlement are being mobilized to improve housing conditions.

routes. You lay down a basic water scheme which puts a standpipe within 100 metres of every dwelling. Then you look at the ground conditions and the culture before installing some basic sanitation—either pit latrines or communal toilets. The aim is to provide the infrastructure and services that people need and relate to. In Brazil, for example, ground that cannot be used for housing is used for football fields which no one would dream of squatting. In South Africa, you might make some space for a crèche or a school, if that's what people want.

Your work has met with a lot of political resistance. Why?

First, informal settlements are considered dangerous and undesirable places that should be got rid of. Second, municipal authorities also have a constituency in the formal areas where people are frightened by the informal settlements. There is also what might be called a technical fear of these settlements on the part of the city authorities. These are places which don't seem to have any identity or order. They don't correspond to any official standards. The authorities are frightened and throw up their hands, saying, "How can you deal with such places?" ▶

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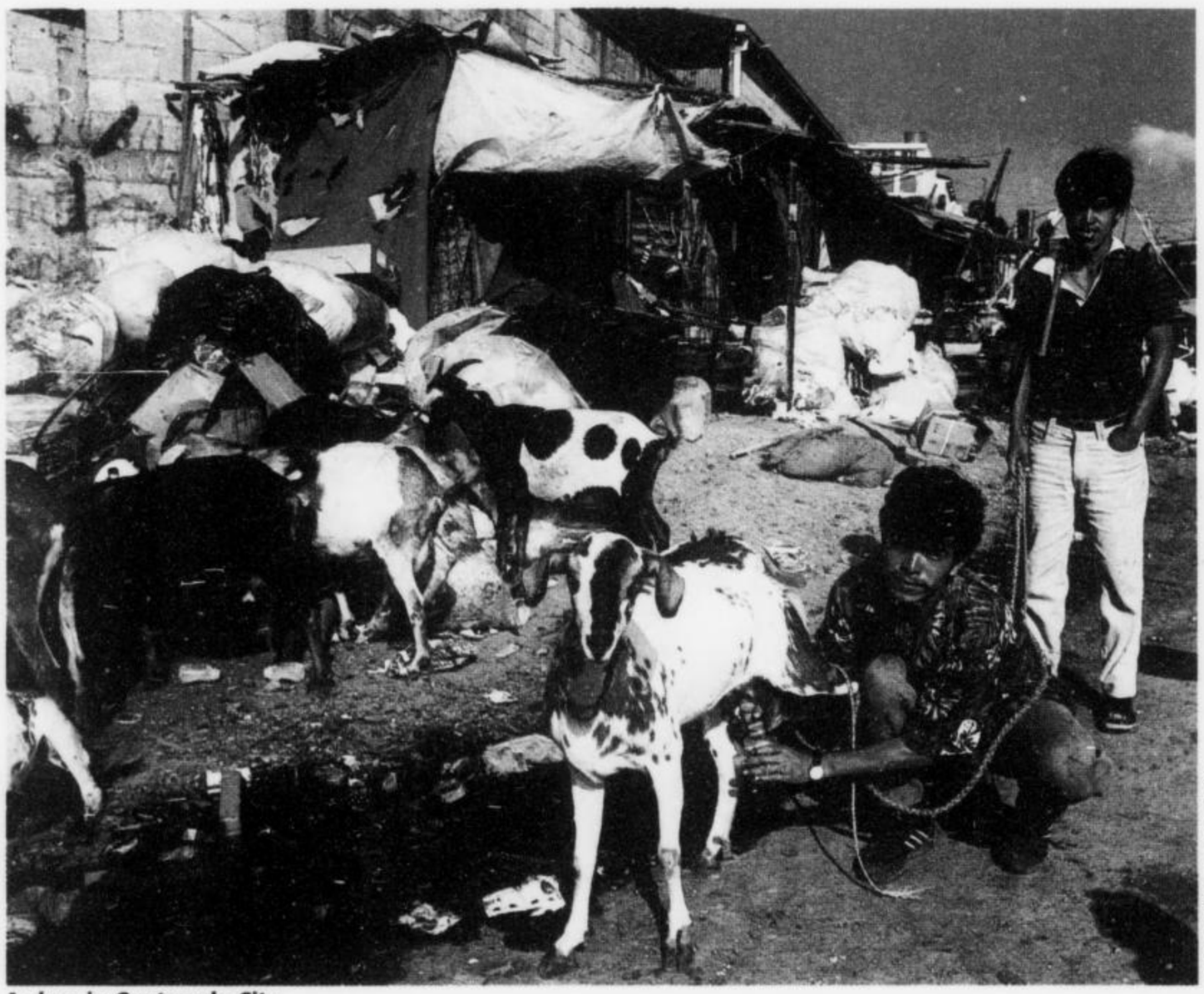
We responded by first of all showing that all attempts to focus on formal housing would not solve the informal housing problem and that this problem would continue to grow no matter how much was spent on formal housing. It took a few years, but this has finally been accepted. The next step lies in showing that upgrading is a viable, replicable methodology.

You've described how to upgrade the informal settlements in Cape Town. But how are you trying to integrate them into the rest of the city?

To begin with, we are putting the informal settlements on the map. We know where they are so we can now create access routes and other services to link them to the rest of the city. Just putting these places on the map is a major step forward. The Brazilian city of Belo Horizonte, which is in some ways our model, has three million people, 40 per cent of whom live in informal settlements. If you look at a map of the city dating from around 1980, a time when the military junta was leaving power, you won't see a single sign of the informal settlements. At that time maps simply showed as blank spaces settlements where thousands of people lived without any physical linkages to the rest of the city.

You cannot just work locally, inside informal settlements. You must also tackle the problem at the metropolitan level. You must know where the settlements are and how they are likely to grow. Then you can create physical linkages so that they aren't islands of exclusion, cut off from the city. Once you have done that, you can go to the planning level and work with people and ask questions. How do you want this area to look? How is it going to integrate into commercial life? These people want access to shops and work opportunities. How do we create those linkages?



© Marco/Ask Images, Paris

A slum in Guatemala City.

Why is it so important to integrate a city?

A city is a complex link between individuals and groups. Its fabric is built on mutual dependency, although we tend not to notice that very much these days. Insecurity and crime in one area are bound to affect other areas. We drain the city's resources by failing to support people who are poor. By dividing a city between rich and poor—or informal and formal areas—you reinforce the fortress mentality and actually limit the city's capacity to grow and develop.

It's not enough to focus on people's short-term needs. You need a long-term vision and plan so that everyone can contribute in some way to the city's development. ■

Interview by René Lefort and Amy Otchet, respectively Director and journalist with the *Unesco Courier*

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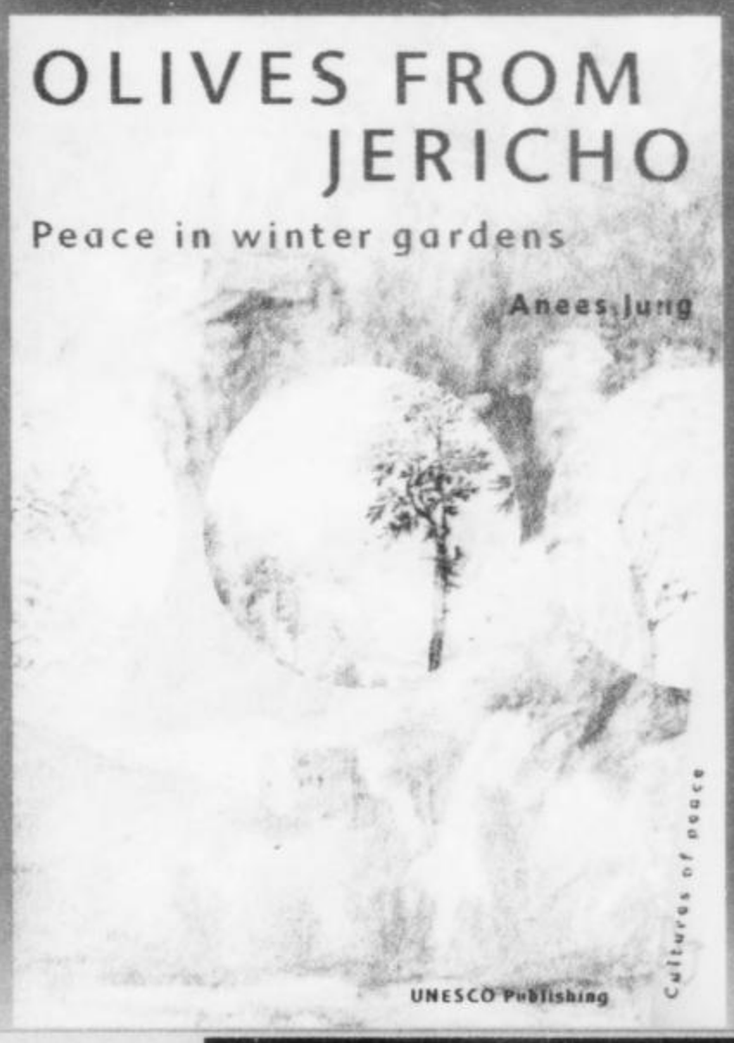

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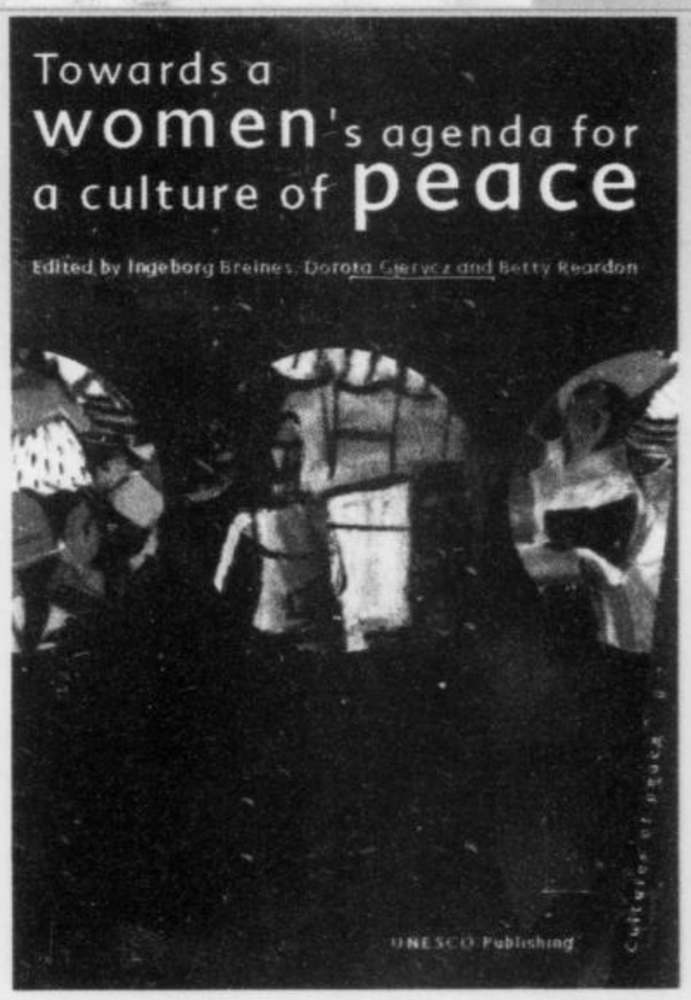
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